BUYNITSKIY, V. Kh.

BUYNITSKIY, V.Kh.

Vladimir IUl'evich Vize. Izv. Vses.geog.ob-va 86 no.4:364-369 Jl-Ag '54. (MLRA 7:9)
(Vize, Vladimir IUl'evich, 1886-1954)

BUYNITSKIY, V.Kh.

Principal characteristics of ice regime in Antarctic waters.
Vest.Len.un. 11 no.6:80-92 '56. (MLRA 9:7)
(Antarctic regions--Ice)

BUYNITSKIY, V.Kh.

The Antarctic convergence as a geographical boundary of antarctic regions. Vest. Len. un. 11 no.24:163-170 '56.
(MLRA 10:2)

(Antarctic regions--Geography)

BUYNITSKIY, V.Kh.

Drifting ice in the Arctic. Geog.sbor. no.12:83-94 '57.
(MIRA 11:1)
(Arctic regions--Ice)

BUYNITSKIY, V.Kh.

Continuous outflow of surface water and general plan of sea ice drift in the Arctic basin. Nauch.dokl.vys.shkoly; geol.-geog.nauki no.1: 42-47 '58. (MIRA 12:2)

1. Leningradskiy universitet, geograficheskiy fakul'tet, kafedra okeanologii.

(Arctic regions--Drift)

SOMOV, M.M., otv. red.; MAKSIMOV, I.V., zamestitel' otv.red.; TRESHNIKOV, A.F., zamestitel' otv.red.; ANDRIYASHEV, A.P., red.; BUYNITSKIY, V.Kh., red.; VORONOV, P.S., red.; DOLGIN, I.M., red.; KALESNIK, S.V., red.; KOROTKEVICH, Ye.S., red.; NIKOL'SKIY, A.P., red.; RAVICH, M.G., red.; TAUBER, G.M., red.; FROLOV, V.V., red.; SLEVICH, S.B., red.; KAPLINSKAYA, L.G., red.izd-va; DROZHZHINA, L.P., tekhn.red.

[Report on observations completed by the Soviet Antarctic Expedition in 1957 and 1958] Otchet o nabliudeniiakh, vypolnennykh Sovetskoi antarkticheskoi ekspeditsiei v 1957 i 1958 gg. Sovetskaia antarkticheskaia ekspeditsiia, 1955-1958. Leningrad, Izd-vo "Morskoi transport," 1960. 39 p (Informatsionnyi biulletin', no.15) (MIRA 13:6)

(Antarctic regions--Russian exploration)

GORDIYENKO, P.A., starshiy nauchnyy sotrudnik; FEDOTOV, V.I., inzh.-laborant; SHIL'NIKOV, V.I., mladshiy nauchnyy sotrudnik; BUYNITSKIY, V.Kh., doktor geograf.nauk, red.; PAKHAREVA, M.M., red.; DROZHZHINA, L.P., tekhn.red.

[Materials of the Soviet Antarctic Expedition, 1955-] Materialy Sovetskoi antarkticheskoi ekspeditsii, 1955- . Leningrad, Izd-vo "Morskoi transport." Vol.11. [Ice cover of the shore waters of eastern Antarctica] Ledianoi pokrov pribrezhnykh vod Vostochnoi Antarktidy. 1960. 116 p.
(MIRA 14:2)

1. Sovetskaya antarkticheskaya ekspeditsiya, 1955- .
(Antarctic regions--Russian exploration)

BUYNITSKIY, V.Kh., doktor geograficheskikh nauk

Lazarev Shelf Ice, its morphology and origin. Inform. biul.Sov.antark.eksp. no.18:5-8 '60. (MIRA 13:7)

1. Leningradskiy gosudarstvennyy universitet.
(Lazarev Shelf Ice)

BUYNITSKIY, V.Kh.

Volume and mass balance of the glacial shield of Antarctica. Vest. LGU 15 no.24:74-82 '60. (MIRA 13:12)
(Antarctic regions--Glaciers)

S/169/62/000/012/074/095
D228/D307

AUTHOR: Buynitskiy, V.Kh.

TITLE: Ice research operations in the 4th Marine Antarctic Expedition on the diesel-electric ship "Ob'"

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 12, 1962, 4, abstract 12V26 (In collection: Materialy po Arktike i Antarktike, no. 1, L., 1961, 29-30)

TEXT: The ice research program provided for: a) ship and aircraft observations of drifting and fast sea-ice; b) continuous photo-radar surveying of icebergs; c) exploration of shelf ice near Stn. Lazarev; and d) laboratory investigations of specimens of buoyant fast sea-ice in order to study their physico-chemical properties. The observations carried out allowed a conclusion to be drawn concerning the influence of living organisms on sea-ice. For example, in the process of their life activity, diatoms settle in a thick layer on the bottom of sea-ice and penetrate for tens of centimeters into it, coloring it from below a deep rusty brown. Owing to their

Card 1/2

Ice research operations ...

dark color diatoms fulfill the role of a unique radiation filter and promote the rapid melting and destruction of ice.
[Abstracter's note: Complete translation]

Card 2/2

S/169/62/000/012/088/095
D228/D307

AUTHOR: Buynitskiy, V.Kh.

TITLE: Volume and balance of matter in the ice shield of Antarctica

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 12, 1962, 69-70, abstract 12V402 (In collection: Materialy po Arktike i Antarktike, no. 1, L., 1961, 43-44)

TEXT: A map, embodying the main morphological features of the ice shield of Antarctica, has been prepared from the materials of very recent data. This map shows that the ice shield of Antarctica is a complex formation. It consists of two, inter-combined centers of glaciation. One of these is located in East Antarctica, the other in West Antarctica. The chief center of glaciation is the ice cap of East Antarctica. Its area is equal to 10.231 million km^2; the average height is close to 2600 m; the maximum height exceeds 4000 m. The ice divide lies at heights of more than 3000 m. A trough, intersecting the ice shield from the Ross Sea to the Weddell

Card 1/3

Volume and balance ...

Sea, is situated between East and West Antarctica. The ice sheet of West Antarctica occupies an area of 2.030 million km^2; its average height equals 1300 m. In West Antarctica another small cap is distinguishable in addition to the main cap; its existence appears to be related to the presence of the mountain range Executive Committee. The area of the entire Antarctic ice shield equals 13.767 million km^2, of which 1.506 million km^2 falls on shelf ice. The average height of the ice shield surface equals 2400 m. The average thickness of ice is 2020 m, and the volume of ice in the shield equals 25.39 million km^3 [Abstracter's note: Unit of measurement incorrectly given as km^2]. The existence of two centers of glaciation creates two independent systems of ice movement. In each of them ice spreads in all directions away from the water divide. Along the trough there is a unique zone where the ice flows converge. The presence of two cast ice assemblages is noted. The calculation made by the author for the balance of matter in the ice shield shows that the present glaciation of Antarctica is in the stage of regression. The expenditure of matter in the ice shield exceeds its income by $0.41 \cdot 10^{18}$ g per annum. The entry of this amount of ice and

Card 2/3

Volume and balance ...

water into the ocean must raise the ocean level by 1.1 mm per annum. According to observational data the world ocean level rose from 1897 to 1946 by 6.2 cm or by 1.2 mm per annum.
[Abstracter's note: Complete translation].

Card 3/3

BUYNITSKIY, Viktor Kharlampiyevich, doktor geogr. nauk, prof., red.; MAKSIMOV, Igor' Vladislavovich, doktor geogr. nauk, prof., red.; BIKULOVA, R.I., red.; KOTLYAKOVA, O.I., tekhn. red.

[Transactions of the Soviet Antarctic Expedition, 1955-]Trudy Sovetskoi antarkticheskoi ekspeditsii, 1955-. Leningrad, Izd-vo "Morskoi transport." Vol.20[Fourth and fifth voyages of the diesel-electric ship "Ob'," 1958-1960; scientific results and observation data]Chetvertyi i piatyi reisy d/e "Ob'," 1958-1960 gg.; nauchnye rezul'taty i materialy nabliudenii. Pod red. V.Kh. Buinitskogo i I.V.Maksimova. 1962. 311 p. (MIRA 16:2)

1. Sovetskaya antarkticheskaya ekspeditsiya, 1955-. 2. Leningradskiy gosudarstvennyy universitet imeni A.A.Zhdanova (for Buynitskiy). 3. Leningradskoye vyssheye inzhenernoye morskoye uchilishche imeni admirala Makarova (for Maksimov).
(Antarctic regions--Russian exploration)

BUYNITSKIY, V.Kh.

Antarctic shelf ice, its morphology, internal structure, and origin. Vest. LGU 18 no.18:82-101 '63. (MIRA 16:11)

BUYNITSKIY, V. Kh.

Movement and the mass balance of ice shelves in the Antarctic.
Vest LGU 19 no. 6:57-70 '64. (MIRA 17:5)

BUYNITSKIY, V.Kh.

Significant date. Vest. LGU 20 no.24:131-134 '65.
(MIRA 19:1)

1. Submitted August 15, 1965.

L 45285-66 EWT(1) GW (N)
ACC NR: AT6023229 SOURCE CODE: UR/2732/66/044/000/0044/0082

AUTHOR: Buynitskiy, V. Kh.; Dmitrash, Zh. A.

26
B+1

ORG: none

TITLE: New data on the physics of Antarctic sea ice

SOURCE: Sovetskaya antarkticheskaya ekspeditsiya, 1955- . Sed'moy reys d/e "Ob'", 1961-1962 gg.; nauchnyye rezul'taty i materialy nablyudeniy (Seventh voyage of the diesel-powered "Ob'", 1961-1966; scientific results and observation data); trudy ekspeditsii, v. 44. Leningrad, Gidrometeoizdat, 1965, 44-82

TOPIC TAGS: sea ice, Antarctic climate, solid physical property, ocean property

ABSTRACT: Particular attention was devoted to a study of the physical properties of sea ice found in the Antarctic during the seventh cruise of the ship Ob' in 1961-1962. Year-old ice and young ice at various stages of formation were investigated. The blocks of ice from which the specimens were sawed off for testing were selected so that along with the task of further accumulation of information concerning the physical properties of sea ice, the problem of the variability of these properties in relation to the character and structure of the ice could be solved. A total of 736 measurements of various physical characteristics of the ice were made.

Card 1/3

ACC NR: AT6023229

including: determinations of salinity, density, bending strength, compression strength, modulus of elasticity with respect to vibrations in bending, and modulus of elasticity with respect to longitudinal vibrations. The investigation was carried out in 15 blocks of ice, 8 of which were from year-old shore ice in Alasheyev Bay and the remainder were taken from various young ice fields in the open sea between Alasheyev Bay and Lazarev Station. In the year-old ice, the maximal salinity was 4.56%, minimal 1.04%, averaging 2.34%. The young ice had a noticeably higher density and differed from the year-old ice by a greater homogeneity. The density of the young ice did not exceed 0.911 — 0.927, whereas the density value for the year-old ice varied from 0.820 to 0.918, averaging 0.877. Each ice specimen was tested under pressure along a line perpendicular and a line parallel to the freezing plane. The average values of the perpendicular and parallel bending strengths for the year-old ice were, respectively, 0.48 and 0.54 kg/cm^2, and for the young ice, 0.33 and 0.31 kg/cm^2. The compression tests revealed that young ice was stronger than year-old ice. The average values for perpendicular and parallel compression tests for young ice were, respectively, 1.04 and 0.65 kg/cm^2, and for year-old ice, 0.79 and 0.62 kg/cm^2. To determine the modulus of elasticity each specimen of ice was subjected twice to testing to determine the frequency of vibrations in bending and to determine the frequency of longitudinal vibrations. The average value of the modulus of elasticity for year-old ice was 75,736 kg/cm^2 at an average temperature of -8.5C. The modulus of elasticity for young ice at temperatures of -10.7C and -2.0C was, respectively, 86,465

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307810020-0"

kg/cm^2 and 29,145 kg/cm^2. The author suggests that the noted decrease in the value of the modulus of elasticity is mainly the result of an increase of ice temperature. Orig. art. has: 5 tables.

SUB CODE: 08, 20/ SUBM DATE: 13Dec65/

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307810020-0"

RONNE, G.G.; GAYDAMAKIN, V.S.; VORONKOV, N.P.; GELLER, D.Yu.; BUYNITSKIY, V.V.

Conversion to automatic control of vulcanization processes. Prom. energ. 17 no.12:4 D '62. (MIRA 17:4)

GVARDIAN, V.A., inzh.; BUYNITSKIY, Ye.A.

Machines for cleaning drainage trenches. Stroi. i dor. mash. 10 no.3:10-12 Mr '65. (MIRA 18:5)

BUYNOV, A.F.

USSR/ Engineering - Automotive springs

Card 1/1 Pub. 128 - 3/26

Authors : Parkhilovskiy, I. G., and Buynov, A. F.

Title : Spring profiles for special sections and the advantage of their application

Periodical : Vest. mash. 2, 19-25, Feb 1954

Abstract : Operational tests were conducted by the Molotov Automobile Plant in Gorkiy, to determine the causes of damage and breaking of suspension springs used on automotive equipment. The shortcomings of the above mentioned equipment are briefly described, and some new improved designs of suspension springs are presented. Nine USSR references (1950-1953). Graph; drawings; illustrations.

Institution : .....

Submitted : .....

BUYNOV, A.F., inzhener; BRAYCHEV, V.P., inzhener; PARKHILOVSKIY, I.G., inzhener; SVESHNIKOV, D.A., inzhener.

Determining the endurance limits of spring steel in the presence of contact stresses. Vest.mash. 35 no.12:51-55 '55. (MLRA 9:5)

1. Gor'kovskiy avtomobil'nyy zavod imeni Molotova.
(Springs (Mechanism))

BUYNOV, A.F.; BRAYCHEV, V.P.

Effect of center band tightening on the fatigue strength of springs.
Avt.i trakt.prom. no.6:17-18 Je '57. (MLRA 10:8)

1.Gor'kovskiy avtozavod imeni Molotova.
(Automobiles--Springs)

GURVICH, I.B., kand. tekhn. nauk; YEGOROVA, A.P.; BUYNOV, A.F.

Increasing the heat resistance of automobile engine parts.
Avt. prom. 28 no.7:39-40 Jl '62. (MIRA 16:6)

1. Gor'kovskiy avtozavod.
(Automobiles—Engines)
(Heat resistant alloys)

L 40826-66 EWT(d)/EWT(l)/EWT(m)/EWP(c)/EWP(v)/T/EWP(t)/ETI/EWP(k)/EWP(h)/EWP(l)

ACC NR: AP6020976 IJP(c) WW/JD/WB SOURCE CODE: UR/0113/66/000/003/0031/0033

AUTHOR: Verner, K. A.; Doronin, V. M.; Buynov, A. F.; Syrkin, P. E.; Letchford, N. I.

ORG: NAMI; "Elektrodetal'" Plant (Zavod "Elektrodetal'"); Gor'kiy Automobile Plant (Gor'kovskiy avtozavod)

TITLE: Chrome-manganese-nickel steel with nitrogen for internal combustion exhaust valves

SOURCE: Avtomobil'naya promyshlennost', no. 3, 1966, 31-33

TOPIC TAGS: internal combustion engine, valve, high temperature steel, chromium, manganese, nickel, hardness, durability, engine reliability, CHROMIUM STEEL, MANGANESE STEEL, NICKEL STEEL / EP303 HIGH TEMPERATURE STEEL

ABSTRACT: The authors discuss and criticize various grades of steel used for valve production. A comparison of existing grades of steel for valve production shows that EP303 steel is best suited for this purpose. It retains its hardness at temperatures of 700-900°C. This shows that it can withstand temperatures from 50 to 100 degrees higher than EI69 and EP48 steels. EP303 steel was tested for thermal stability to determine its resistance to scale formation in air and corrosion resistance in lead oxide at 900°C. EP303 steel compares favorably with the other grades of steel tested. The test results were used as a basis for trying out this steel in the mass production of valves. The manufacturing process is discussed. Valves made from EP303 and EP48

Card 1/2 UDC: 621.431.73:62-332.002.2

L 40826-66
ACC NR: AP6020976

steels were then compared on test stands and under operating conditions. These tests were carried out at the Gor'kiy Automobile Plant. The valves were tested in GAZ-51, GAZ-51a and GAZ-21d engines and others. High octane gasoline was used throughout the test since it develops high temperature conditions. Tests showed that valves made from EP303 steel retain their clearances throughout the test period in contrast to those made from EP48 steel. The data acquired during stand testing are in agreement with operational data. Valves made from EP303 steel have a hardness of HRC 38. These valves operate very well in GAZ engines and improve engine reliability. The service life of the new valves is triple that of valves with a built up VKhN-1 facing, and more than four times that of valves made from EP48 steel. The production of EP303 steel has been adopted by the Gor'kiy Automobile Plant for making the exhaust valves of GAZ and ZMZ engines. Orig. art. has: 4 figures, 1 table.

SUB CODE: 13/ SUBM DATE: none/ ORIG REF: 007/ OTH REF: 001

Card 2/2 MLP

ACC NR: AP7006946 SOURCE CODE: UR/0129/67/000/001/0046/0048

AUTHOR: Verner, K. A.; Zelenova, V. D.; Doronin, V. M.; Buynov, A. F.

ORG: NAMI; GAZ; "Elektrostal'" Factory (Zavod "Elektrostal'")

TITLE: The effect of phosphorus on the structure and properties of 5Kh20N4AG9 steel

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 1, 1967, 46-48

TOPIC TAGS: austenitic steel, steel structure, precipitation hardenable steel, phosphorus, ~~containing steel~~, chromium, ~~containing steel~~, manganese, ~~containing steel~~, molybdenum, ~~containing steel~~, nickel, ~~containing steel~~, nitrogen, steel property, phase composition, valve, exhaust valve, ~~steel~~ mechanical property/ 5Kh20N4AG9 steel

ABSTRACT: The effect of phosphorus on the mechanical properties, structure, phase composition, and dispersion strengthening of austenitic 5Kh20N4AG9 steel (0.51–0.60%C, 0.36–0.86%Si, 8.61–8.95%Mn, 20.2–21.2%Cr, 3.95–5%Ni, 0.68–0.73%Mo, 0.24–0.36%N, 0.016–0.42%P), used for engine exhaust valves, has been investigated. Ingots were forged at 1160–950°C

Card 1/2 UDC: 669.14.018.8:620.17:620.18

ACC NR: AP7006946

rolled to bars 20–25mm in diameter, and made into valves which were austenitized at 1150–1200°C, quenched, and aged at 700–800°C. Alloying 5Kh20N4AG9 steel with phosphorus increased the mechanical properties at room and high temperatures. For instance, at 20 and 800°C, steel with 0.16%P and 0.72%Mo (Mo added up to 1% retards grain growth which is increased by P) has, respectively, a tensile strength of 133, and 44 kg/mm^2, an elongation of 6 and 10%, a reduction of area of 10 and 18%, notch toughness of 1.38 and 3.63 kgm/cm^2, and a Brinell hardness of 393 and 124 compared to 103 and 34 kg/mm2, 8 and 25%, 10 and 28%, an undetermined notch toughness, and an HB hardness of 302 and 109, at 20 and 800°C respectively, for 5Kh20N4AG9 steel containing 0.04%P. Steel containing 0.2%P and up to 1% Mo had the best combination of mechanical properties. Up to 0.2%P intensifies dispersion strengthening. After quenching, the phosphorus, disolved in austenite, increases the lattice parameter, brings about strain and stress in the lattice, and increases the rate of precipitation of chromium carbide ($Cr_{23}C_6$) and nitride (Cr_2N), but P itself remains in the solid solution. Orig. art. has: 1 figure and 1 table.

[WW]

SUB CODE: 11/ SUBM DATE: none/ ORIG REF: 001

Card 2/2

L 43942-66 EWT(d)/EWT(m)/T/EWP(f)/EWP(t)/ETI IJP(c) JT/WB/JD

ACC NR: AP6027296 SOURCE CODE: UR/0133/66/000/008/0742/0745

AUTHOR: Doronin, V. M.; Topilin, V. V.; Verner, K. A.; Buynov, A. F.

ORG: Elektrostal' Plant (Zavod Elektrostal'); Scientific Research Automobile and Automotive Institute (N-i. avtomobil'nyy i avtomotornyy institut); Gorky Automobile Plant (Gor'kovskiy avtomobil'nyy zavod)

TITLE: New steel for exhaust valves of internal-combustion engines

SOURCE: Stal', no. 8, 1966, 742-745

TOPIC TAGS: chromium nickel steel, manganese containing steel, nitrogen containing steel, austenitic steel, exhaust valve steel

ABSTRACT: A new age-hardenable austenitic 5Kh20N4AG9 (EP 303) steel (0.50—0.60% C, 8.0—10.0% Mn, 19—23% Cr, 3.5—4.5% Ni, and 0.3—0.5% N) has been developed. The steel is fully austenitic and is strengthened by the precipitation of carbonitrides. The steel, annealed at 1180C, water quenched, and aged for 10—15 hr at 770C, has an R_C hardness of 31—32. At 700, 800 and 900C the respective tensile strength was 50, 30, and 20 kg/mm^2 and the 100-hr rupture strength was 20, 10, and 5 kg/mm^2. The steel has high oxidation resistance. The weight increase in 300 hr at 900C amounted to 12.3 kg/m^2. The corrosion susceptibility of the steel is lower than that of other valve steels. The weight loss in exhaust gases containing PbO, PbO_2, and $2PbO \cdot PbBr_2$ at 850—950C in 135-min test amounted to 3047 g/m^2·hr compared to 5080 g/m^2·hr for

Card 1/2 UDC: 669.14.018.8

L 43942-66
ACC NR: AP6027296 2

EI69 steel. In tests of dimension stability, the EP303 valve grew by 0.16 mm in 215 hr compared to 0.7 mm for EP48 steel. Under operational conditions, the EP303 valves had 100% longer service life than EP48 valves. Orig. art. has: 9 figures and 2 tables. [WW]

SUB CODE: 10,11/ SUBM DATE: none/ ORIG REF: 004/ OTH REF: 004/ ATD PRESS: 506/

precipitation hardening
18

Card 2/2 hs

L 11196-67 EWT(d)/EWT(m)/EWP(k)/EWP(h)/EWP(f)/EWP(v)/EWP(l) FDN/DJ
ACC NR: AR6030391 SOURCE CODE: UR/0273/66/000/006/0028/0028

AUTHOR: Verner, K. A.; Buynov, A. F.; Doronin, V. M. 51

TITLE: Austenite steel with low nickel concentration for the exhaust valves in internal combustion engines operating at temperatures up to 900°C 14

SOURCE: Ref. zh. Dvigateli vnutrennego sgoraniya, Abs. 6.39.188

REF SOURCE: Tr. Tsentr. n.-i. avtomob. i avtomotorn. in-ta, vyp. 81, 1966, 66-68

TOPIC TAGS: engine exhaust system, high temperature valve, internal combustion engine, low alloy steel, austenite steel

ABSTRACT: EP303 low-alloy chrome-manganese-nickel austenite steel has been developed for the exhaust valves in internal combustion engines operating at temperatures up to 900°C. Heat treatment conditions have been worked out for producing high mechanical properties in EP303 steel at high temperatures. The hardness (HRC up to 38) resulting from heat treatment of the valves obviates the necessity for using hard metal surfacing or special caps on the ends of the valve rods. EP303 steel has satisfactory technological properties during steel production and manufacturing of the valves. Exhaust valves made from EP303 steel ensure reliable engine performance, a stable heat gap, lower deformation of the valve plates and an increase in their service life by a factor of 2 compared with EP48 steel valves. The "Elektrostal'" Plant has worked all "bugs" out of the production of EP303 steel throughout the entire metallurgical cycle. EP303 steel has been introduced by the Gorky Automobile Plant in production of exhaust valves for the GAZ and ZMZ engines. [Translation of abstract]

SUB CODE: 21, 11, 13

Card 1/1 jb UDC: 669.14:621.431.73-332

BUYNOV, A. V.

USSR/ Electronics - Telephones

Card 1/1 Pub. 133 - 8/24

Authors : Buynov, A. V., Cand. of Techn. Sc.

Title : Technical defects of the new V-3 telephone unit

Periodical : Vest. svyazi 6, page 14, June 1954

Abstract : Critical comments are presented on the quality of a newly manufactured V-3 three-channel high-frequency telephone unit. The easily avoidable structural defects and assembly defects are listed.

Institution : ...

Submitted : ...

BUYNOV, A.V., kandidat tekhnicheskikh nauk.

Determining allowable irregularities of frequency characteristics of residual attenuation in high-frequency telephone channels. Sbor.trud. Len.elek.inst.sviazi no.1:42-47 '56.
(Telephone lines) (MLRA 10:1)

L 42178-66 EWT(m)/T/EWP(t)/ETI IJP(c) WW/JD/JG/GD

ACC NR: AT6022480 (A) SOURCE CODE: UR/0000/65/000/000/0116/0120

AUTHOR: Kislyakov, I. P.; Smirnova, I. N.; Buynov, B. I.; Khomutova, T. V.; Tokunov, T. V.

ORG: Moscow Institute of Fine Chemical Technology im. M. V. Lomonosov (Moskovskiy Institut tonkoy khimicheskoy tekhnologii) 44 B+1

TITLE: Synthesis and solubility of barium, calcium, and manganese tungstates in melts of certain salts

SOURCE: Vsesoyuznoye soveshchaniye po fizicheskoy khimii rasplavlennykh soley. 2d, Kiev, 1963. Fizicheskaya khimiya rasplavlennykh soley (Physical chemistry of fused salts); trudy soveshchaniya. Moscow, Izd-vo Metallurgiya, 1965, 116-120.

TOPIC TAGS: tungstate, barium compound, calcium compound, manganese compound, solubility, chemical precipitation, aqueous solution, temperature dependence, recrystallization

ABSTRACT: Manganese tungstate was prepared by precipitation from aqueous solutions of $MnCl_2$ and Na_2WO_4, and $MnWO_4 \cdot 2H_2O$ was obtained. A study of the solubility of dehydrated $MnWO_4$ in Na_2WO_4 and Na_2WO_4 + 20% NaCl melts showed it to be strongly temperature-dependent. Three different types of $MnWO_4$ crystals corresponding to three different regions of crystallization were obtained. Manganese tungstate was also prepared in the melt via the reaction $Na_2WO_4 + MnCl_2 \rightarrow 2NaCl + MnWO_4$, and the product did not differ from that prepared by recrystallization. Barium tungstate was obtained by

Card 1/2

L 42178-66

ACC NR: AT6022480

precipitation from dilute aqueous solutions of $BaCl_2$ and Na_2WO_4. A microvisual-polythermal method was used in studying the solubility in the $BaCl_2$-$BaWO_4$ system at high temperatures. Coarsely crystalline $BaWO_4$ was prepared by recrystallizing dehydrated $BaWO_4$ in molten $BaCl_2$ and also by the reaction $BaCO_3 + WO_3 \rightarrow BaWO_4 + CO_2$ in the same medium. Calcium tungstate was obtained in similar fashion. Its solubility in $CaCl_2$ at high temperatures was determined. Attempts to crystallize $CaWO_4$ from $CaCl_2$ melt showed this method to be inappropriate in air (the $CaWO_4$ crystals contained excess CaO). Orig. art. has: 4 figures and 1 table.

SUB CODE: 07/ SUBM DATE: 23Aug65/ ORIG REF: 003/ OTH REF: 002

Card 2/2

BUYNOV, Arkadiy Vasil'yevich; PUSTOVOYTENKO, O.D., otv.red.; PETROVA, V.Ye., red.; KARABILOVA, S.F., tekhn.red.

[Characteristics of telephone channels and the quality of transmission] Kharakteristiki telfonnykh kanalov i kachestvo peredachi. Moskva, Gos.izd-vo lit-ry po voprosam sviazi i radio, 1959. 47 p. (MIRA 12:6)
(Telephone)

S/194/61/000/011/067/070
D271/D302

AUTHOR: Buynov, A.V.

TITLE: Problems involved in making use of channels temporarily free from speech

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika, no. 11, 1961, 1, abstract 11 L3 (Tr. nauchno-tekhn. konferentsii Leningr. elektrotekhn. in-ta svyazi, no. 1, [illegible], 1961, 127-132)

TEXT: Constructional principles of the experimental equipment which allows an increase in the number of simultaneous calls on a given number of telephone channels are considered. It is a peculiar property of telephone call that each of the one-way channels constituting a modern telephone path is engaged only during about 40% of the time. If the present practice of allocating channels to subscribers is abandoned and the subscriber is given a channel only when he speaks, the capacity of telecommunication systems

Card 1/2

Problems involved in making use...

can be increased 1.5-2 times. Principles on which the experimental equipment could be based are considered, their effectiveness and the difficulties involved in the development of this equipment. [Abstracter's note: Complete translation]

Card 2/2

BUYNOV, A.V., kand. tekhn. nauk; MOROZOV, A.P., inzh.

Pay telephone for long-distance communication. Vest. sviazi 24 no.11:14 N '64. (MIRA 18:2)

CHERTKOVA, Ye.I.; BUYNOV, N.I.

Studies on the effect of drugs on Mycobacterium tuberculosis with electron microscope. Probl. tuberk., Moskva no.1:22-28 Jan-Feb 1953. (CLML 24:2)

1. Candidate Medical Sciences for Chertkova; Candidate Physical Sciences for Buynov. 2. Of Sverdlovsk Scientific-Research Tuberculosis Institute (Director -- Doctor Medical Sciences I. A. Shaklein) and of the Institute of the Physics of Metals (Director -- Candidate Technical Sciences S. S. Nosyreva).

BUYNOV, N. I. and Lerinman, R. M.

"Electron-Microscopic Study of Initial Stages of Decay of Supersaturated Solid Solutions in Alloys on Aluminum Base. Article I. Aging of the Alloy Aluminum-Copper (4% Cu)"
Tr. In-ta Fiziki Metallov Uralsk, Fil. AN SSR, No 14, 1954, 3-9

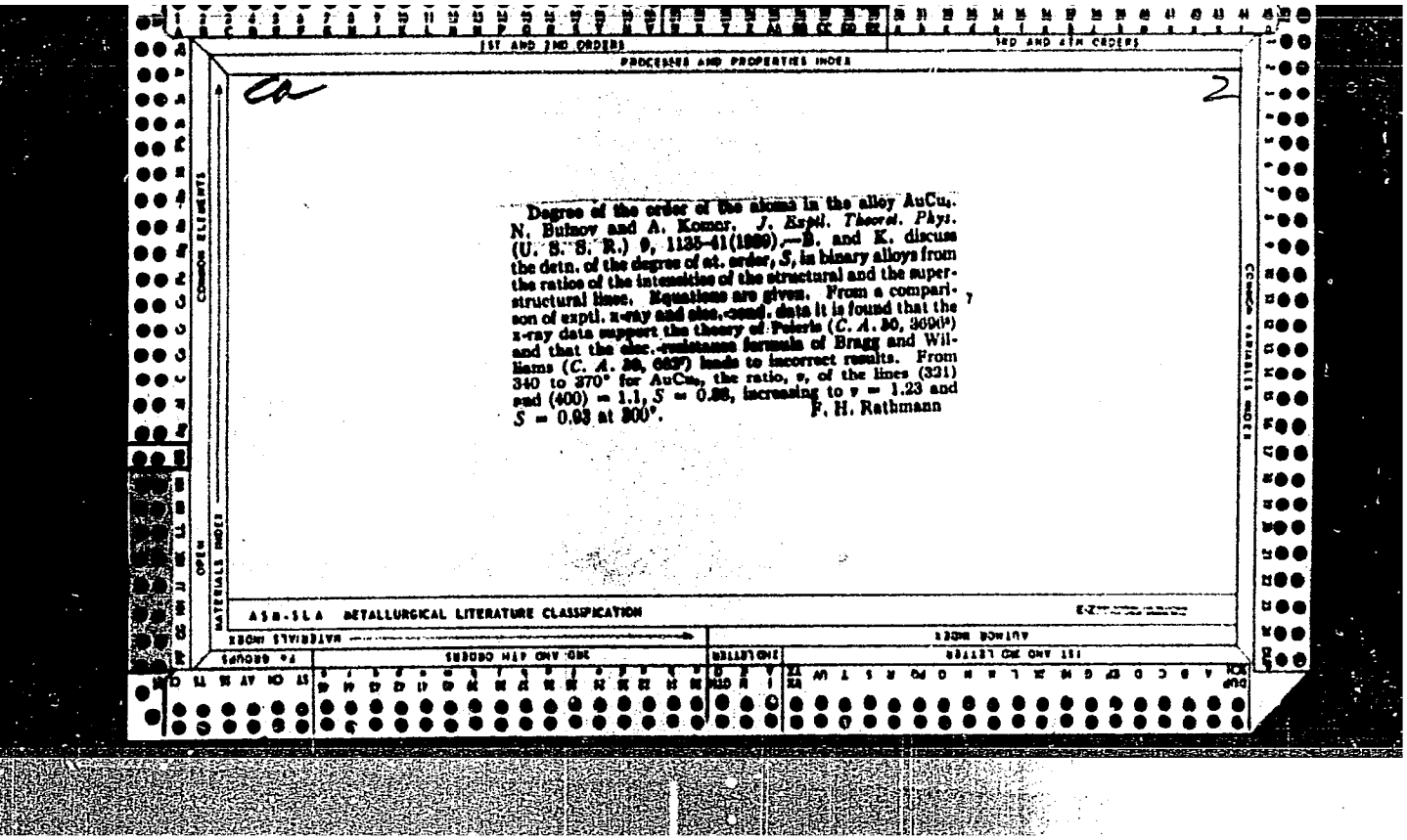
Various Al-Cu alloys were subjected to aging at various temperatures. The deposit of new phase particles occurred during annealing and initial stage of decay proceeded at great speed. The decay process during artificial aging consists of two stages: first a deposit occurs on interfaces of mosaic blocks, and later on the inside. These results explain the anomalous behavior of the lattice period and electric resistance during natural aging and the peculiarities of behavior of hardness-time curves during artificaial aging. (RZhFiz, No 9, 1955_

SO: Sum-No 787, 12 Jan 56

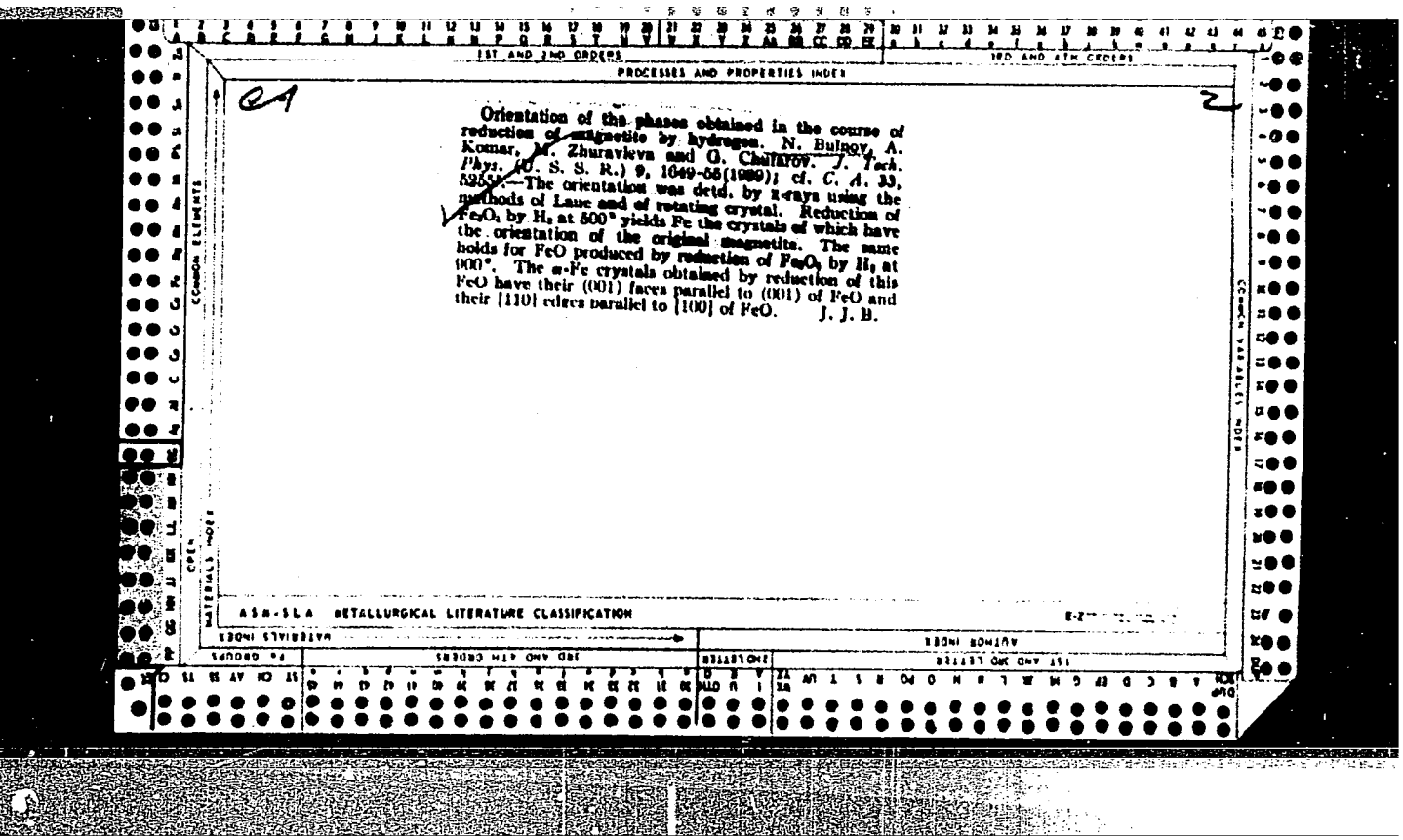
ZAKHAROVA, R.R.; BUYNOV, N.I.

Effect of the addition of a third component on the aging of aluminum-silver alloys. Fiz. met. i metalloved. 10 no.3:375-381 S '60.
(MIRA 13:10)

1. Institut fiziki metallov AN SSSR.
(Aluminum silver alloys--Metallography)



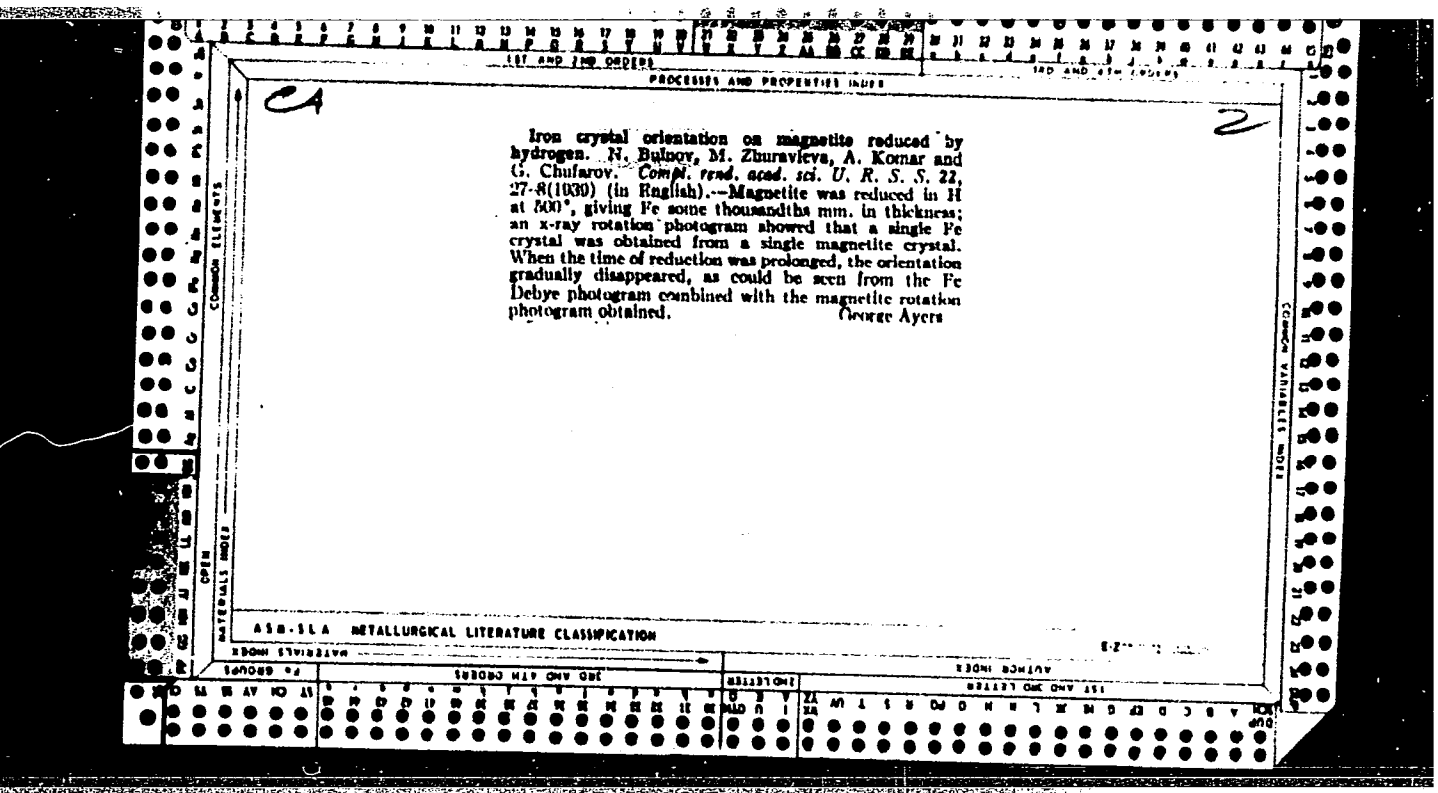
Degree of the order of the atoms in the alloy $AuCu_3$. N. Buinov and A. Komar. *J. Exptl. Theoret. Phys.* (U. S. S. R.) 9, 1135-41(1939).—B. and K. discuss the detn. of the degree of at. order, S, in binary alloys from the ratios of the intensities of the structural and the superstructural lines. Equations are given. From a comparison of exptl. x-ray and elec.-cond. data it is found that the x-ray data support the theory of Peierls (*C. A.* 30, 3090[8]) and that the elec.-resistance formula of Bragg and Williams (*C. A.* 30, 6627) leads to incorrect results. From 340 to 370° for $AuCu_3$, the ratio, r, of the lines (321) and (400) = 1.1, S = 0.86, increasing to r = 1.23 and S = 0.93 at 300°. F. H. Rathmann



PROCESSES AND PROPERTIES INDEX

Orientation of the phases obtained in the course of reduction of magnetite by hydrogen. N. Bulnov, A. Komar, M. Zhuravleva and O. Chelnokov. *J. Tech. Phys. (U. S. S. R.)* 9, 1049-55(1939); cf. *C. A.* 33, 5253⁸.—The orientation was detd. by x-rays using the methods of Laue and of rotating crystal. Reduction of Fe_2O_3 by H_2 at 500° yields Fe the crystals of which have the orientation of the original magnetite. The same holds for FeO produced by reduction of Fe_2O_3 by H_2 at 900°. The α-Fe crystals obtained by reduction of this FeO have their (001) faces parallel to (001) of FeO and their [110] edges parallel to [100] of FeO. J. J. B.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



CA

2

Iron crystal orientation on magnetite reduced by hydrogen. N. Bulnov, M. Zhuravleva, A. Komar and G. Chufarov. *Compt. rend. acad. sci. U. R. S. S.* 22, 27-8(1939) (in English).--Magnetite was reduced in H at 500°, giving Fe some thousandths mm. in thickness; an x-ray rotation photogram showed that a single Fe crystal was obtained from a single magnetite crystal. When the time of reduction was prolonged, the orientation gradually disappeared, as could be seen from the Fe Debye photogram combined with the magnetite rotation photogram obtained.

George Ayers

CA

N. N. Bulgakov

2

The structure of metallic films obtained on the surface of aqueous solutions of metal salts by action of reducing gases. I. The structure of platinum films. N. N. Bulgakov, N. V. Desyatnikov, A. B. Shur, and O. O. Preobrazhenskaya. *Zhur. Fiz. Khim.* 11, 300-06(1949); cf. C.A. 43, [illegible]. Pt films were prepd. on H_2O by passing H over the surface of Pt salt solns., transferred on collodion films, and examd. in an electron microscope. The results, together with earlier results obtained by using x-ray, electron diffraction, and kinetic methods (cf. Dumenev, *Trudy Inst. Khim. i Met., Akad. Nauk S.S.S.R., Ural. Filial*, 1948, No. 1) show that the films start as sep. crystals smaller than the limit of the electron microscope (30 A.). Later these crystals combine to aggregates, 0.6-1 μ in size, which have no definite shape but show preferred angles of 90° and 120°; this means that coagulation is anisotropic. The aggregates not only lie in the surface but form also under the surface. When the av. thickness of the film is less than 150 A., the aggregates form branched chains; and at greater thicknesses the film is similar to a Pt sponge.

J. J. Bikerman

BUYNOV, N. N.

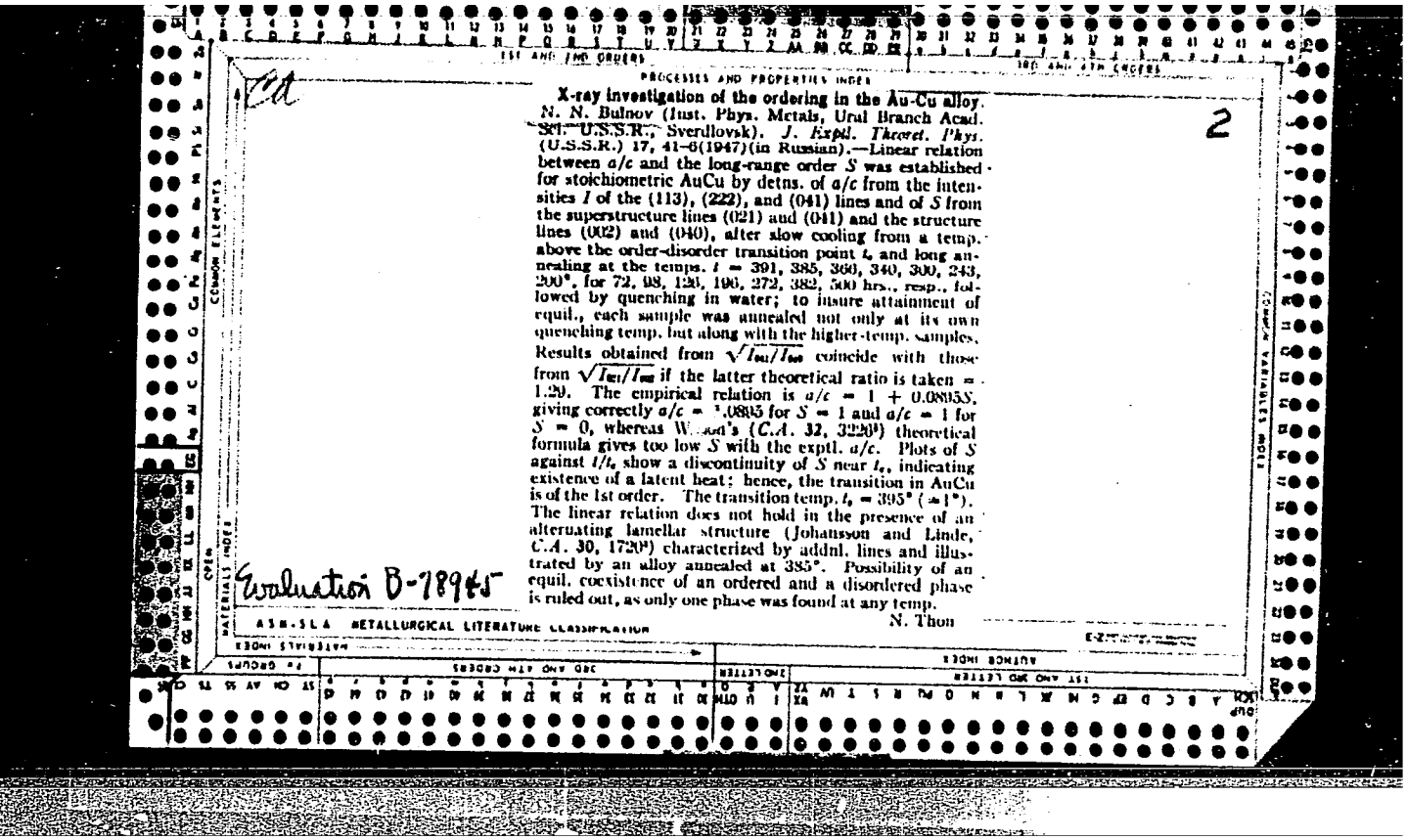
Roentgenographic Study of the Degree of Remote Order in Alloys of the AuCu System.

Ural Industrial Institue imeni Kirev, Sverdlovsk, 1943.

So: U-1837, 14 April 52.

KOMAR, AP, GERTSRIKEN, S., BUYNOV, N. N.

Aluminization of Copper and Brass. "Texco," 1943.



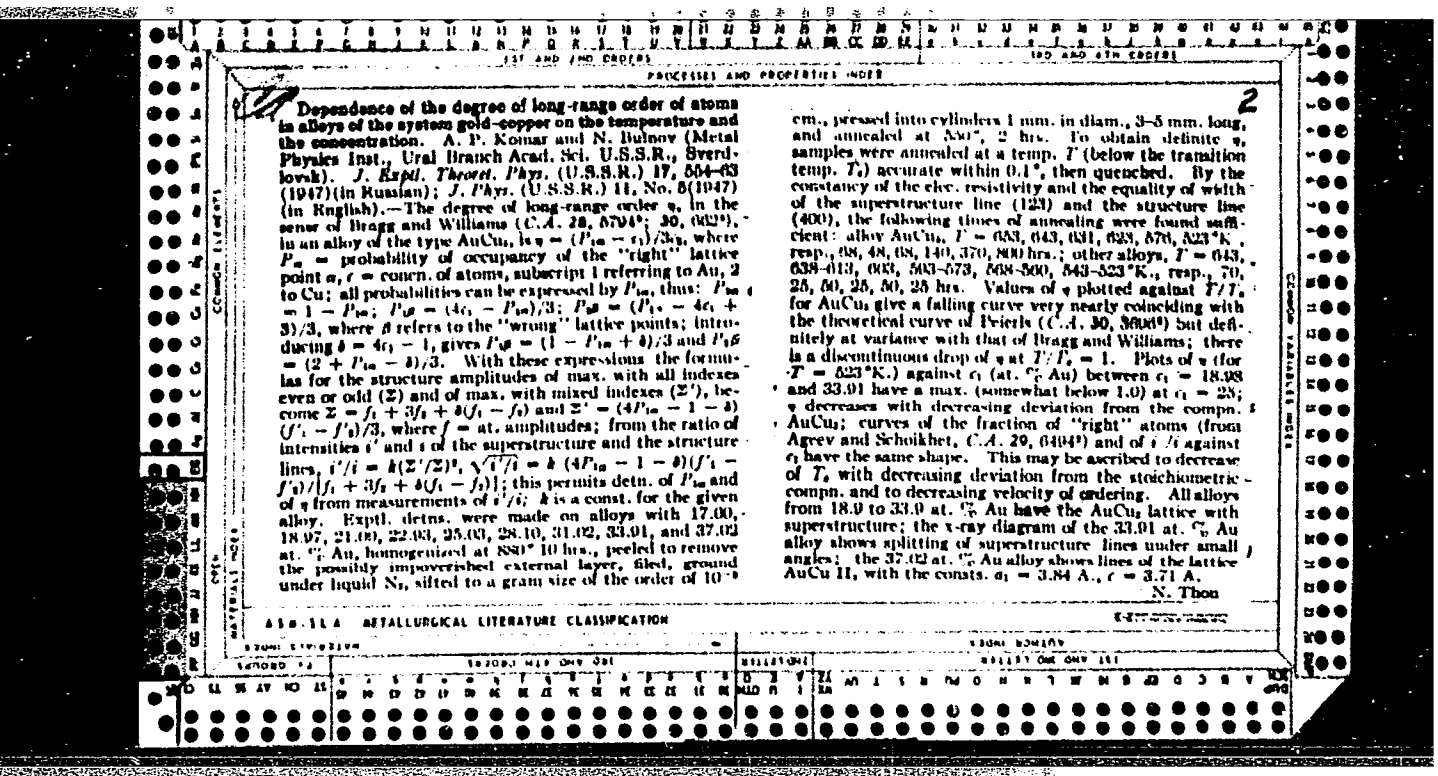
PROCESSES AND PROPERTIES INDEX

X-ray investigation of the ordering in the Au-Cu alloy. N. N. Bulnov (Inst. Phys. Metals, Ural Branch Acad. Sci. U.S.S.R., Sverdlovsk). *J. Exptl. Theoret. Phys.* (U.S.S.R.) 17, 41–6(1947)(in Russian).—Linear relation between a/c and the long-range order S was established for stoichiometric AuCu by detns. of a/c from the intensities I of the (113), (222), and (041) lines and of S from the superstructure lines (021) and (041) and the structure lines (002) and (040), after slow cooling from a temp. above the order-disorder transition point t_c and long annealing at the temps. t = 391, 385, 360, 340, 300, 243, 200°, for 72, 98, 120, 196, 272, 382, 500 hrs., resp., followed by quenching in water; to insure attainment of equil., each sample was annealed not only at its own quenching temp. but along with the higher-temp. samples. Results obtained from $\sqrt{I_{001}/I_{000}}$ coincide with those from $\sqrt{I_{021}/I_{000}}$ if the latter theoretical ratio is taken = 1.29. The empirical relation is $a/c = 1 + 0.0885S$, giving correctly a/c = 1.0885 for S = 1 and a/c = 1 for S = 0, whereas Wood's (*C.A.* 32, 3220[3]) theoretical formula gives too low S with the exptl. a/c. Plots of S against t/t_c show a discontinuity of S near t_c, indicating existence of a latent heat; hence, the transition in AuCu is of the 1st order. The transition temp. t_c = 395° (±1°). The linear relation does not hold in the presence of an alternating lamellar structure (Johansson and Linde, *C.A.* 30, 1720[8]) characterized by addnl. lines and illustrated by an alloy annealed at 385°. Possibility of an equil. coexistence of an ordered and a disordered phase is ruled out, as only one phase was found at any temp.

N. Thon

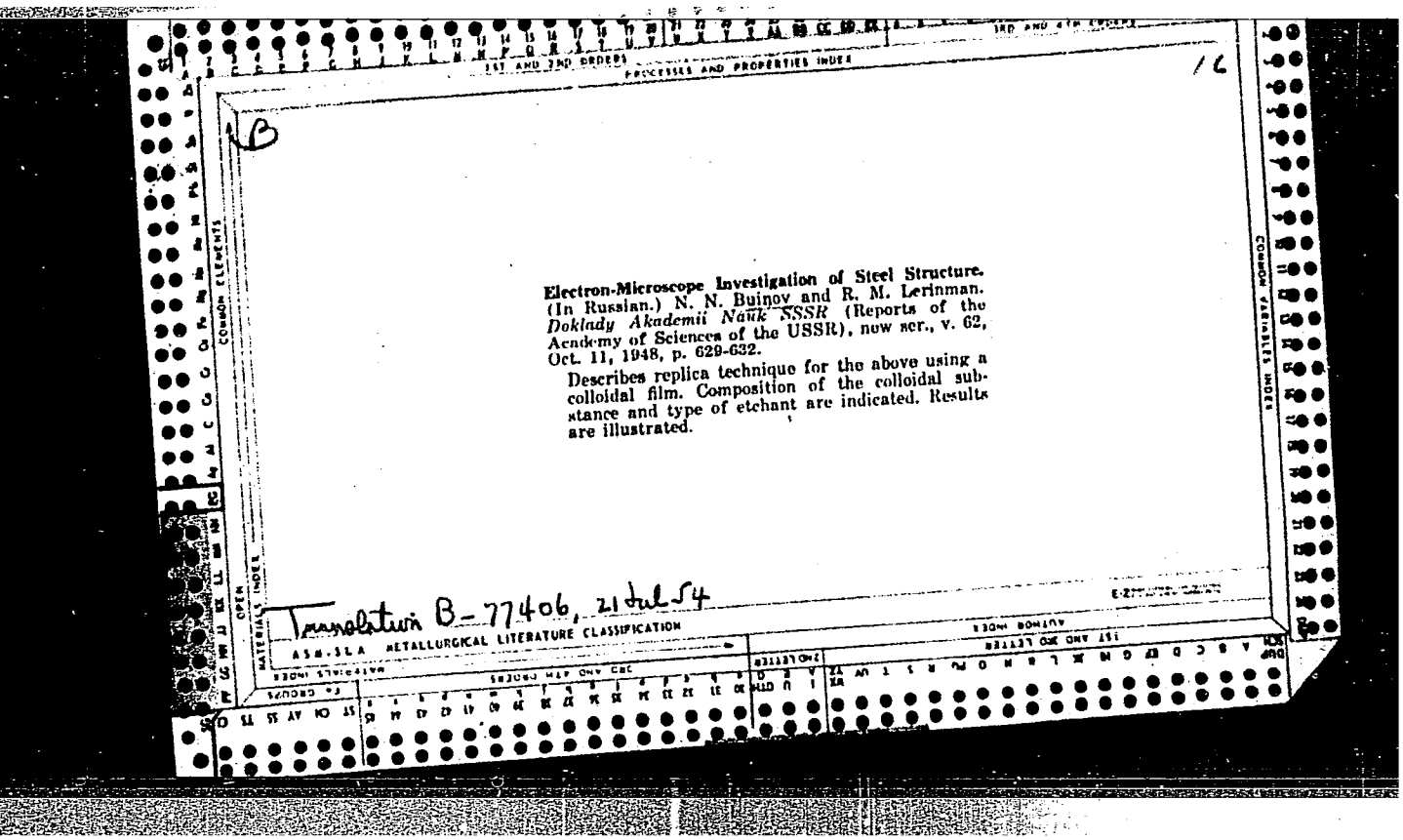
Evaluation B-78945

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



Dependence of the degree of long-range order of atoms in alloys of the system gold-copper on the temperature and the concentration. A. P. Komar and N. Bulnov (Metal Physics Inst., Ural Branch Acad. Sci. U.S.S.R., Sverdlovsk). *J. Expl. Theoret. Phys.* (U.S.S.R.) **17**, 554–63 (1947)(in Russian); *J. Phys.* (U.S.S.R.) **11**, No. 5(1947) (in English).—The degree of long-range order η, in the sense of Bragg and Williams (*C.A.* **28**, 5794[9]; **30**, 6029[9]), in an alloy of the type $AuCu_3$, is $\eta = (P_{1a} - c_1)/3c_2$, where P_{1a} = probability of occupancy of the "right" lattice point a, c = concn. of atoms, subscript 1 referring to Au, 2 to Cu; all probabilities can be expressed by P_{1a}, thus: $P_{2a} = 1 - P_{1a}$; $P_{1\beta} = (4c_1 - P_{1a})/3$; $P_{2\beta} = (P_{1a} - 4c_1 + 3)/3$, where β refers to the "wrong" lattice points; introducing $\delta = 4c_1 - 1$, gives $P_{1\beta} = (1 - P_{1a} + \delta)/3$ and $P_{2\beta} = (2 + P_{1a} - \delta)/3$. With these expressions the formulas for the structure amplitudes of max. with all indexes even or odd (Σ) and of max. with mixed indexes (Σ'), become $\Sigma = f_1 + 3f_2 + \delta(f_1 - f_2)$ and $\Sigma' = (4P_{1a} - 1 - \delta)(f'_1 - f'_2)/3$, where f = at. amplitudes; from the ratio of intensities i' and i of the superstructure and the structure lines, $i'/i = k(\Sigma'/\Sigma)^2$, $\sqrt{i'/i} = k(4P_{1a} - 1 - \delta)(f'_1 - f'_2)/|f_1 + 3f_2 + \delta(f_1 - f_2)|$; this permits detn. of P_{1a} and of η from measurements of i'/i; k is a const. for the given alloy. Expt. detns. were made on alloys with 17.00, 18.97, 21.00, 22.03, 25.03, 28.10, 31.02, 33.01, and 37.02 at. % Au, homogenized at 880° 10 hrs., peeled to remove the possibly impoverished external layer, filed, ground under liquid N_2, sifted to a gram size of the order of 10^{-3} cm., pressed into cylinders 1 mm. in diam., 3–5 mm. long, and annealed at 350°, 2 hrs. To obtain definite η, samples were annealed at a temp. T (below the transition temp. T_0) accurate within 0.1°, then quenched. By the constancy of the elec. resistivity and the equality of width of the superstructure line (123) and the structure line (400), the following times of annealing were found sufficient: alloy $AuCu_3$, T = 693, 643, 631, 623, 578, 523°K., resp., 96, 48, 68, 140, 370, 800 hrs.; other alloys, T = 643, 638–613, 603, 593–573, 568–500, 543–523°K., resp., 70, 25, 50, 25, 50, 25 hrs. Values of η plotted against T/T_0 for $AuCu_3$ give a falling curve very nearly coinciding with the theoretical curve of Peierls (*C.A.* **30**, 3600[9]) but definitely at variance with that of Bragg and Williams; there is a discontinuous drop of η at $T/T_0 = 1$. Plots of η (for T = 523°K.) against c_1 (at. % Au) between c_1 = 18.03 and 33.01 have a max. (somewhat below 1.0) at c_1 = 25; η decreases with decreasing deviation from the compn. $AuCu_3$; curves of the fraction of "right" atoms (from Agrev and Schoikhet, *C.A.* **29**, 6404[9]) and of i'/i against c_1 have the same shape. This may be ascribed to decrease of T_0 with decreasing deviation from the stoichiometric compn. and to decreasing velocity of ordering. All alloys from 18.9 to 33.0 at. % Au have the $AuCu_3$ lattice with superstructure; the x-ray diagram of the 33.01 at. % Au alloy shows splitting of superstructure lines under small angles; the 37.02 at. % Au alloy shows lines of the lattice AuCu II, with the consts. a_1 = 3.84 A., c = 3.71 A.

N. Thon

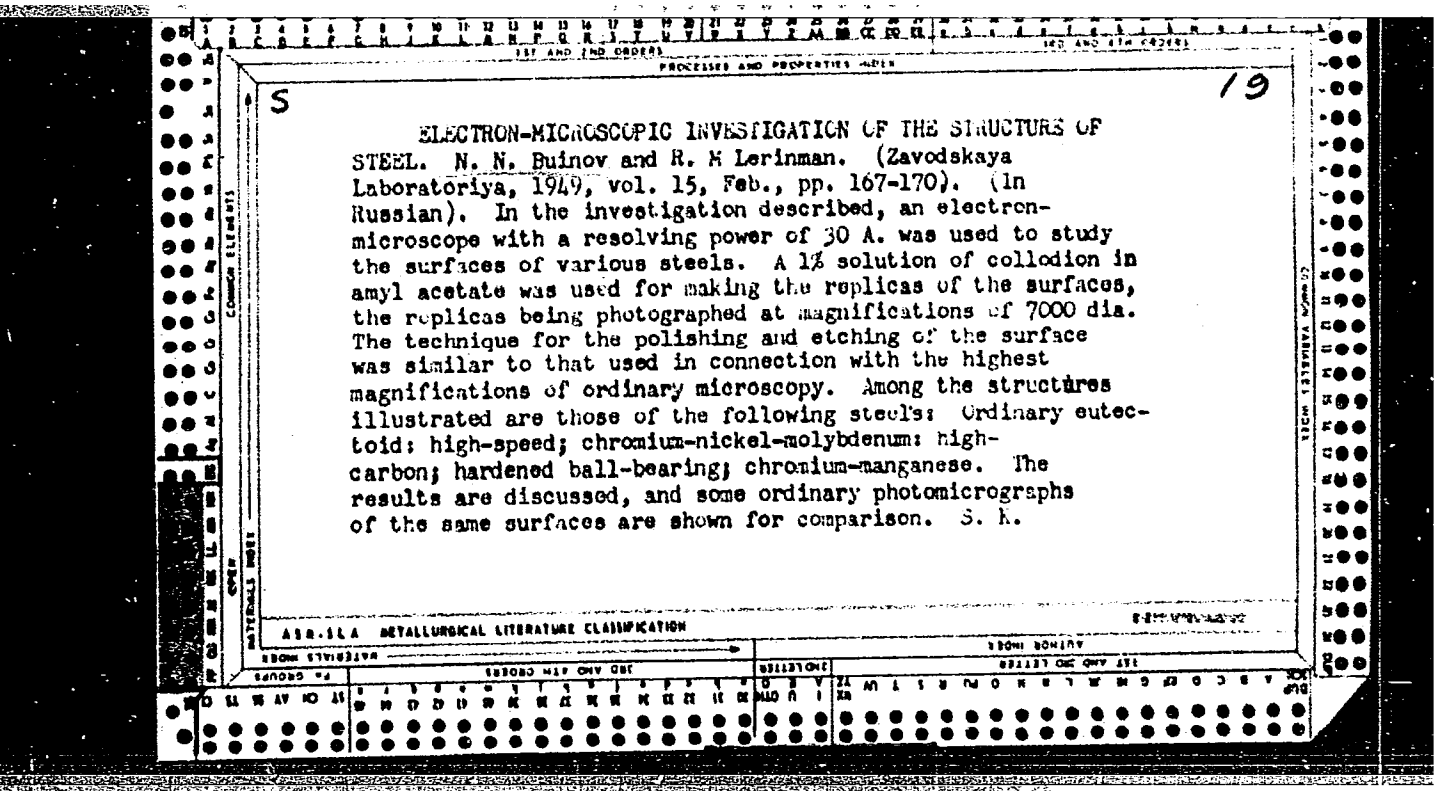


Electron-Microscope Investigation of Steel Structure. (In Russian.) N. N. Buinov and R. M. Lerinman. *Doklady Akademii Nauk SSSR* (Reports of the Academy of Sciences of the USSR), new ser., v. 62, Oct. 11, 1948, p. 629-632.

Describes replica technique for the above using a colloidal film. Composition of the colloidal substance and type of etchant are indicated. Results are illustrated.

Translation B-7740, 21 Jul 54

Investigation of the Structures of Metallic Films Formed on the Surface of Aqueous Solutions of Metal Salts by the Action of Reducing Gases. I.-- The Structure of Platinum Films. N. N. Buinov, N. V. Demenev, A. S. Shur, and O. G. Fedorova (Kolloid, Zhur., 1949, 11, (5), 289-298; C. Abs., 1950, 44, 901).--(In Russian). Platinum films were prepared on water by passing hydrogen over the surface of platinum salt solutions, transferred on to colloidion films, and examined in an electron microscope. The results, together with earlier results obtained by using X-ray, electron diffraction, and kinetic methods (cf. Demenev, Trudy Inst. Khim. i Met., Akad. Nauk. S.S.S.R., Ural. Filial, 1948, (1)) show that the films start as separate crystals smaller than the limit of the electron microscope (30 Å.). Later these crystals combine to aggregates, 0·5-1 μ in size, which have no definite shape but show preferred angles of 90° and 120°; this means that coagulation is anisotropic. The aggregates not only lie in the surface but form also under the surface. When the average thickness of the film is 120 Å., the aggregates form branched chains; and at greater thicknesses the film is similar to a platinum sponge.



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19

ELECTRON-MICROSCOPIC INVESTIGATION OF THE STRUCTURE OF STEEL. N. N. Buinov and R. M Lerinman. (Zavodskaya Laboratoriya, 1949, vol. 15, Feb., pp. 167-170). (In Russian). In the investigation described, an electron-microscope with a resolving power of 30 A. was used to study the surfaces of various steels. A 1% solution of collodion in amyl acetate was used for making the replicas of the surfaces, the replicas being photographed at magnifications of 7000 dia. The technique for the polishing and etching of the surface was similar to that used in connection with the highest magnifications of ordinary microscopy. Among the structures illustrated are those of the following steels: Ordinary eutectoid; high-speed; chromium-nickel-molybdenum; high-carbon; hardened ball-bearing; chromium-manganese. The results are discussed, and some ordinary photomicrographs of the same surfaces are shown for comparison. S. K.

USSR/Physics May 49
Electron Microscopy
Platinum

"Electron-Microscope Investigation of the Structure of Platinum Films on the Surface of Water Solutions of Metal Salts by the Action of Gas Regenerators," N. N. Buynov, N. V. Demenev, A. S. Shur, G. G. Fedorova, Inst of Chem and Metal, Inst of Phys of Metals, Ural Affiliate, Acad Sci USSR, 4 pp

"Dok Ak Nauk SSSR" Vol LXVI, No 2

Presents results of an investigation of platinum [redacted] 52/49T100

USSR/Physics (Contd) May 49

films produced on surfaces of aqueous potassium chloroplatinate solutions by action of hydrogen on the surface. Used an RCA transmission magnetic electron microscope, type EMU-2A. Took ordinary stereoscopic and diffraction photographs. In initial reduction stages films consisting of separate elementary crystals whose dimensions are less than 50 angstroms are obtained. When time of reduction is increased, thicker films are obtained, very porous and consisting of units of various sizes. Suggests that forces responsible for coagulation along the surface of elementary crystals are unevenly distributed. Submitted by Acad A. N. Frumkin, 11 May 49

[redacted] 52/49T100

BUYNOV, N. N.

27128. [illegible], P. V. [illegible], O. A. [illegible] NOV, N. N. PERLMAN, R. I. - Poteri kremnii ya pri vyplavke ferrosi li tsi ya. Doklady akad. nauk SSSR, novaya seri ya T. LXII, No 6, 1949, c. 1073-76

SO: Letopis'Zhurnal'nykh Statey, Vol. 36, 1949

M

***Electron-Microscopical Investigation of the Structure of Gold Foils Obtained on the Surface of Aqueous Solutions of a Salt of the Metal by the Action of Reducing Gases.** N. V. Demenev, N. N. Buinov, and M. I. Milyutina (*Doklady Akad. Nauk S.S.S.R.*, 1949, **68**, (4), 721-723).—[In Russian]. The gold foils were selected from a preliminary X-ray examination which showed that crystal dimensions of the order 150 Å. could be expected. The foils were obtained on the surface of dil. auric chloride solutions by reduction with hydrogen gas and arsine. The influence of the rate of formation of the foils on their structure was investigated by varying the velocity and pressure of the current of reducing gas, and the foil thickness was determined by weighing. The investigation revealed that the foils were extremely porous and consisted of individual crystals and three-dimensional aggregates. In such foils, of an average thickness $\lesssim$100 Å., the shape and dimensions of individual crystallites can be conveniently studied. The most frequent shapes are hexagons, pentagons, and triangles, rarely rhombs. The first three of these are projections of the octahedral, cubic-octahedral, and pyramid-shaped gold crystallites, of which the last are undeveloped octahedral forms, or cubes. The hexagonal, pentagonal, and triangular shapes can only be observed when the crystallites are so oriented that one of the octahedral faces lies in the surface of the solution. Other forms of the crystallites are also possible. The average size of the particles was determined from the distribution curve of the crystallites, and by electronography. It was found that the size of the crystallites increases with reduction of the velocity of the current of reducing gas. The maximum for a foil obtained in 16 hr. and having an average thickness of 25 Å. was 140 Å., and for a foil obtained in 15 min. of an average thickness 40 Å., 110 Å.—B. F. K.

Oct. 1950

CA

2

Structure of the metal films prepared on the surfaces of aqueous solutions of metal salts by the action of reducing gases. II. Structure of gold films. N. V. Demenev, N. N. Bulnov, and M. I. Mityutina (Ural Branch, Acad. Sci. U.S.S.R.). *Kolloid. Zhur.* 12, 253-5(1950); cf. *C.A.* 43, 6038h; 44, 9026b.—Au films produced in the surface of a $AuCl_3$ soln. by H or AsH_3 consist of aggregates of crystals sepd. by empty spaces. The most frequent size of the crystals was, e.g., 110-140 A. in films whose av. thickness (detd. by weighing) was 25-40 A. Films produced rapidly (e.g. 140 A. in 1 min.) have crystals of approx. identical sizes, combined into dendrites, whereas films produced slowly (e.g. 100 A. in 3 hrs.) usually consist of (often hexagonal) clusters of relatively large crystals surrounding a small crystal. These results were obtained with an electron microscope.

J. J. Bikerman

CA

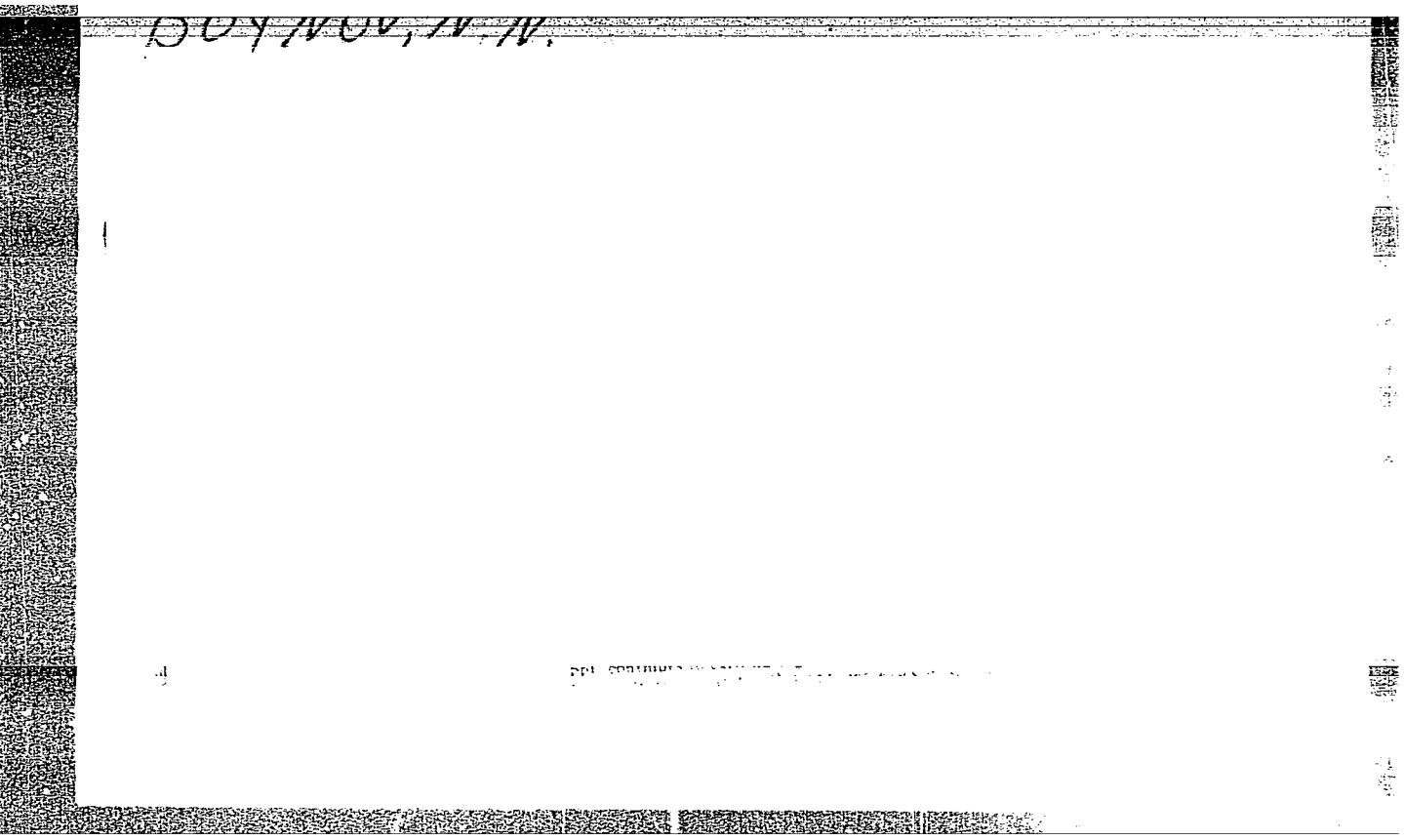
Smelting of silicon alloys. P. V. Gel'd and N. N. Rulmov. *Zhur. Priklad. Khim.* **23**, 1087–94(1950); *J. Gen. Chem.* **23**, 1151–8(1951)(Engl. translation).—Samples of fume deposits from elec. furnaces smelting 45% FeSi, 75% FeSi, Si metal, and FeSiCr were obtained from the surface of the charge, electrode, electrode holder, and mantle. Chem. analysis indicated that the deposits were predominantly Si and SiO; if the total Si present was calcd. as SiO and SiO$_2$, the analyses totaled 103.20–129.00%. Microscopic examn. of fume deposits indicated that they were opaque and consisted of 2 phases, and that they were formed from SiO which condensed as a liquid and decompd. into Si and SiO$_2$ at a temp. above the m.p. of Si. Fumes leaving the furnace charge consistd. of spherical particles of SiO$_2$ 50–10,000 A. in diam. formed by oxidation of an SiO fog. H. W. R.

C.A.

2

Electron-microscopic study of the structure of palladium films produced on the surface of aqueous solutions of metal salts by the action of reducing gases N. V. Ikonnikov, N. N. Bulnov, and M. I. Milyutina (Metal Phys. Inst., Ural Branch Acad. Sci. U.S.S.R., Sverdlovsk). *Doklady Akad. Nauk S.S.S.R.* 73, 751-4(1950). Pd films produced by H_2 on the surface of solns. of $PdCl_2$ are highly porous and consist of crystallites ranging from 25 to 90 A., with a max around 50 A.; the coarser particles appear to be aggregates of several crystallites. Rapid reduction results in more homogeneous size distribution, whereas slow reduction gives more highly heterogeneous films. Thick films obtained by rapid reduction show a high proportion of aggregates, evidently formed around single coarse particles acting as coagulation centers. Slow reduction produces aggregates of seemingly triangular shape which, on stereoscopic examn are seen to be hollow cones with the generatrix lying in the plane of the film.

N. Thon



M

3

***Fine Structure Developed in the Ageing of Aluminium Alloys.** N. N. Bujnov and R. M. Lerinman (*Doklady Akad. Nauk S.S.S.R.*, 1950, **74**, (5), 925–931).—[In Russian]. The alloys studied were aluminium 4% copper, aluminium 10% silver, and aluminium 1·4% Mg_2Si. Ageing above 150° C. produces platelets of precipitate which, in the aluminium–copper alloy are ∥ to the cube faces of the aluminium and in the aluminium–silver alloy are ∥ to the octahedral faces. In the aluminium–magnesium–silicon alloy the precipitates are in the form of rods ∥ to the cube edges. The measured magnitudes of the precipitates are quoted for a few cases: for example, ageing the aluminium–copper alloy at 180° C. gives plates of length from a few hundred Å. to 1 μ and thickness from 50 to 200 Å. As the temp. of ageing is raised the dimensions of the plates and rods increase. In all the alloys studied the precipitates show a fine structure which takes the form of elongated particles. In aluminium–copper and aluminium–magnesium–silicon alloys the long direction of the particles is ∥ to one of the cube edges and in aluminium–silver alloys the long direction is ∥ to a (110) direction. The elongated particles are found to be arranged with their long direction either ∥ or ⊥ to the long dimensions of the plates and rods. As an example, in aluminium–magnesium–silicon alloy aged at 200° C. for 1–5½ hr. the length of the particles is 200–300 Å., and the transverse dimension varies from <50 to 100 Å. Ageing at higher temp. increases the size of the particles; they become less elongated and sometimes merge together. Five electron-micrographs are shown, including a stereo pair.—A. F. B.

Sept. 1951

Bulnov, N. N.

(4)

THE STUDY OF DEFORMED ALUMINUM SINGLE CRYSTALS WITH AN ELECTRON MICROSCOPE. (Izuchenie Deformirovannykh Kristallov Alyuminiya v Elektronnom Mikroskope). M. V. Yakutovich, E. S. Yakovleva, R. M. Lerinman, and N. N. Bulnov. Translated by A. Pingell from Izvest. Akad. Nauk, S.S.S.R. Ser. Fiz. 15, 383-6(1951). 10p. (NRL-Trans-453)

BUYNOV, N. N.

USSR/Metals - Metallurgy 1 Jul 51

"Submicroscopic Structure of Al-Ni Alloy," N. N. Buynov, R. M. Leriman, Inst of Phys of Metals, Ural Affiliate, Acad Sci USSR

"Dok Ak Nauk SSSR" Vol LXXIX, No 1, pp 69-72

Fine structure of ferromagnetic alloy Ni 25%, Al 14%, Cu 0.15% with FE remainder was investigated under electron microscope for various values of coercive force depending on heat treatment. Describes several tests. Authors are indebted to A. P. Komar, Act Mem, Ural Affiliate, Acad Sci USSR, and Prof F. M. Galperin for advice and to M. F. Komarova for exptl help. Presented by Acad I.P. Bardin 9 May 51.

210T72

BUYNOV, N. N.

USSR/Metals - Ferromagnetic Alloys, Structure 11 Oct 51

"Submicroscopic Structure of Magnico," N. N. Buynov, V. V. Klyushin, Inst of the Phys of Metals, Ural Affiliate, Acad Sci USSR

"Dok Ak Nauk SSSR" Vol LXXX, No 5, pp 739-742

Using electron microscope, studies structure corresponding to high-coercive states of magnico-alloy with compn: 50% Fe, 24% Co, 14% Ni, 9% Al and 3% Cu. Investigation is continuation of works by N. N. Buynov and R. M. Lerinman ("Dok Ak Nauk SSSR" Vol LXXIV, No 4, 5, 1950, Vol LXXIX, No 1, 1951) on nature of high-coercive force in alni-alloys. Submitted by Acad I. P. Bardin 28 Jul 51. 221T46

BUYNOV, N. N.

USSR/Engineering - Refractories, Processes 11 Oct 51

"Sublimates on Heating Silicates in Reducing Atmosphere," P. S. Mamykin, P. V. Gel'd and N. N. Buynov

"Dok Ak Nauk SSSR" Vol LXXX, No 5, pp 801-804

Investigates phenomenon of pneumatological transfer of silica during high-temp firing of silicates. Reviews several cases of silica sublimation and discusses expts of firing crucibles made of carborundum fire clay mixt at 1,500° C. Presents several micrographs obtained with electron microscope. Submitted by Acad D. S. Belyankin 15 Aug 51.

PA 221T43

USSR/Chemistry - Titanium Dec 52

"The Structure of the Double Sulfate of Titanium and Potassium," I. V. Demenev, N. N. Buinov and V. M. Polyakova

"DAN SSSR" Vol 87, No 6, pp 965, 966

The structure of $2K_2SO_4.2TiOSO_4.5H_2O$ was investigated with an electron microscope. It was found that it consists of crystals having a size of 10-30 Å. These crystals form aggregates. Submitted by Acad I. P. Bardin 23 Oct 52.

240T1

BUYNOV, N.N.; LERINMAN, R.M.

Electron microscopic investigation of the structure of magnetic alloys. I. Alni alloy. Izvest. Akad. Nauk S.S.S.R., Ser. Fiz. 16, 623-6 '52. (CA 47 no.19:9888 '53) (MLRA 6:3)

BUYNOV, N.N.; KLYUSHIN, V.V.

Electron microscopic investigation of the structure of magnetic alloys. II. Magnico alloy. Izvest. Akad. Nauk S.S.S.R., Ser. Fiz. 16, 627-30 '52. (MLRA 6:3)
(CA 47 no.19:9888 '53)

1. N. N. BUYINOV, V. P. SAVINYKH

2. USSR (600)

4. Aluminum Alloys

7. Effect of plastic deformation on subsequent decomposition in aluminum alloys. Al - Mg - Si. Dokl. AN SSSR 88 No. 1. 1953.

9. Monthly List of Russian Accessions, Library of Congress, April 1953, Uncl.

BUYNOV, N. N.

USSR/Metallurgy - Aluminum Alloys 11 Jan 53

"Effect of Plastic Deformation on Subsequent Decomposition in Aluminum Alloys Al-Si and Al-Mg-Si," N.N. Buynov, V. P. Savinykh, Inst of the Physics of Metals, Ural Affiliate Acad Sci USSR

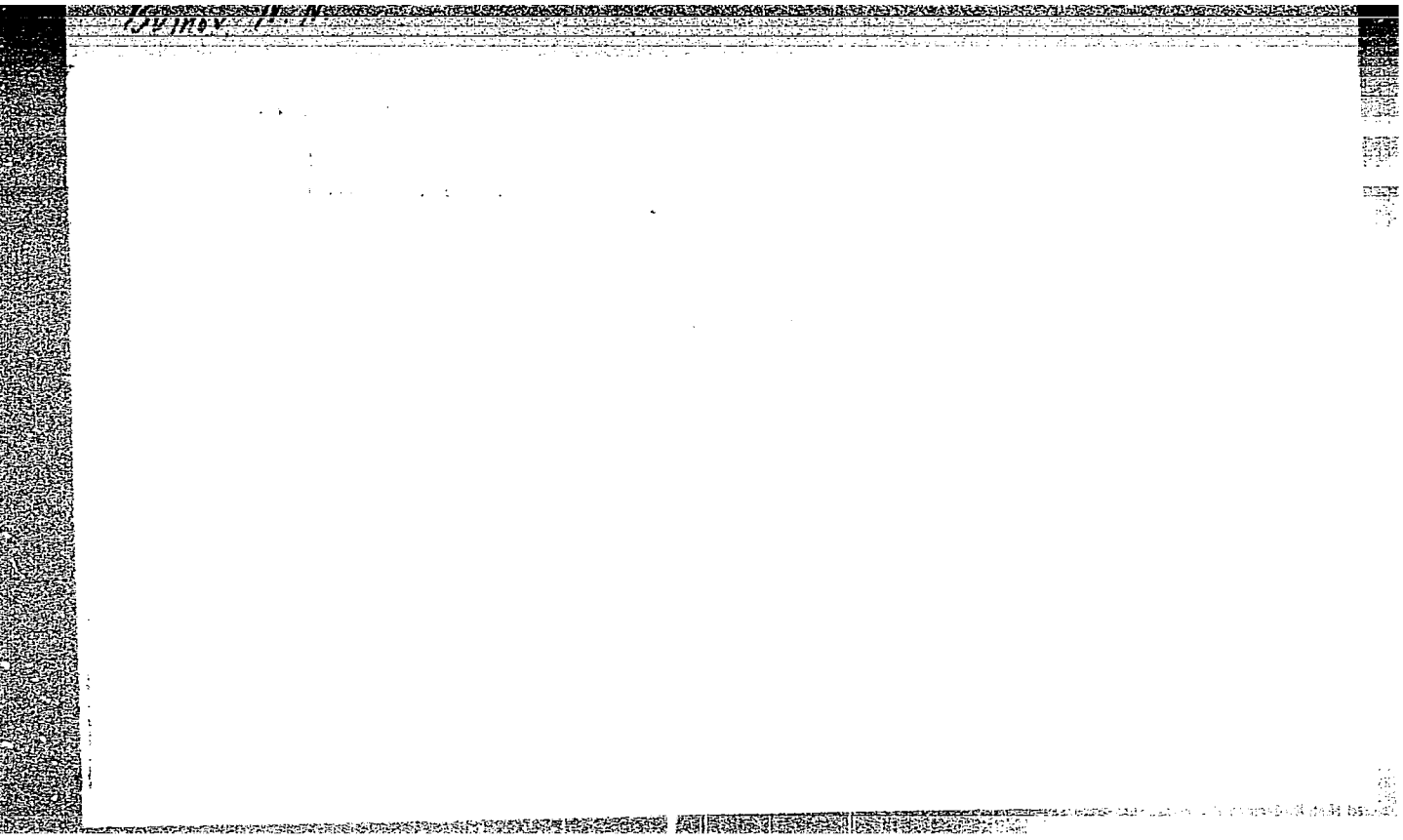
DAN SSSR, Vol 88, No 2, pp 257-259

Using electron microscope, investigates Al-base alloys with 1.2% Si and 1.4% Mg_2Si by method of oxide films. Disproves generally accepted assumption that decomposition after preliminary deformation occurs mainly in zones of slip traces. Extion occurs mainly in zones of predominant localization plains such absence of predominant localization

249T22

of decomposition by distribution of residual stresses in entire volume of specimen and not only in zones of slip. Analyzes this phenomenon. Presented by Acad I. P. Bardin 11 Nov 52.

249T22



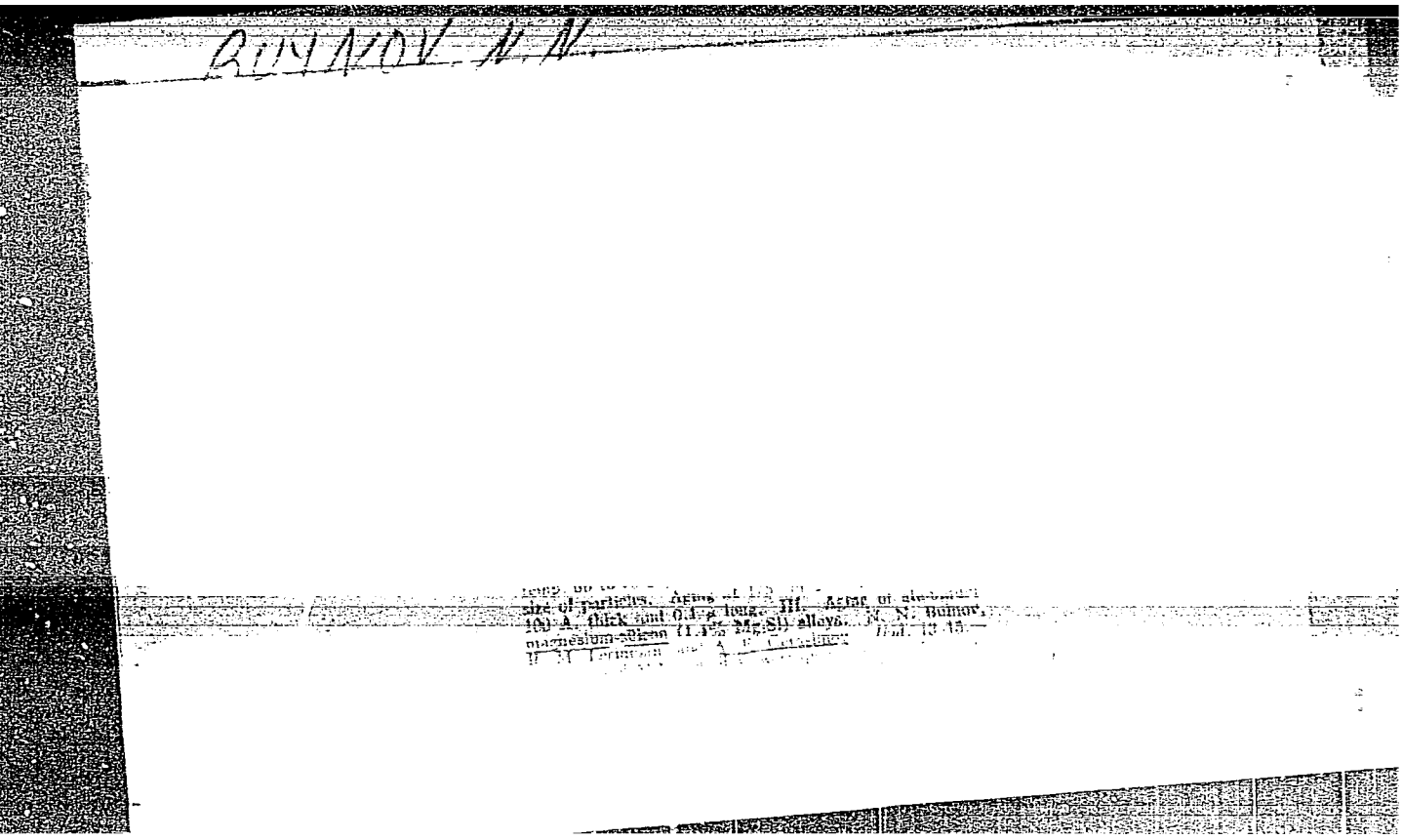
APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307810020-0"

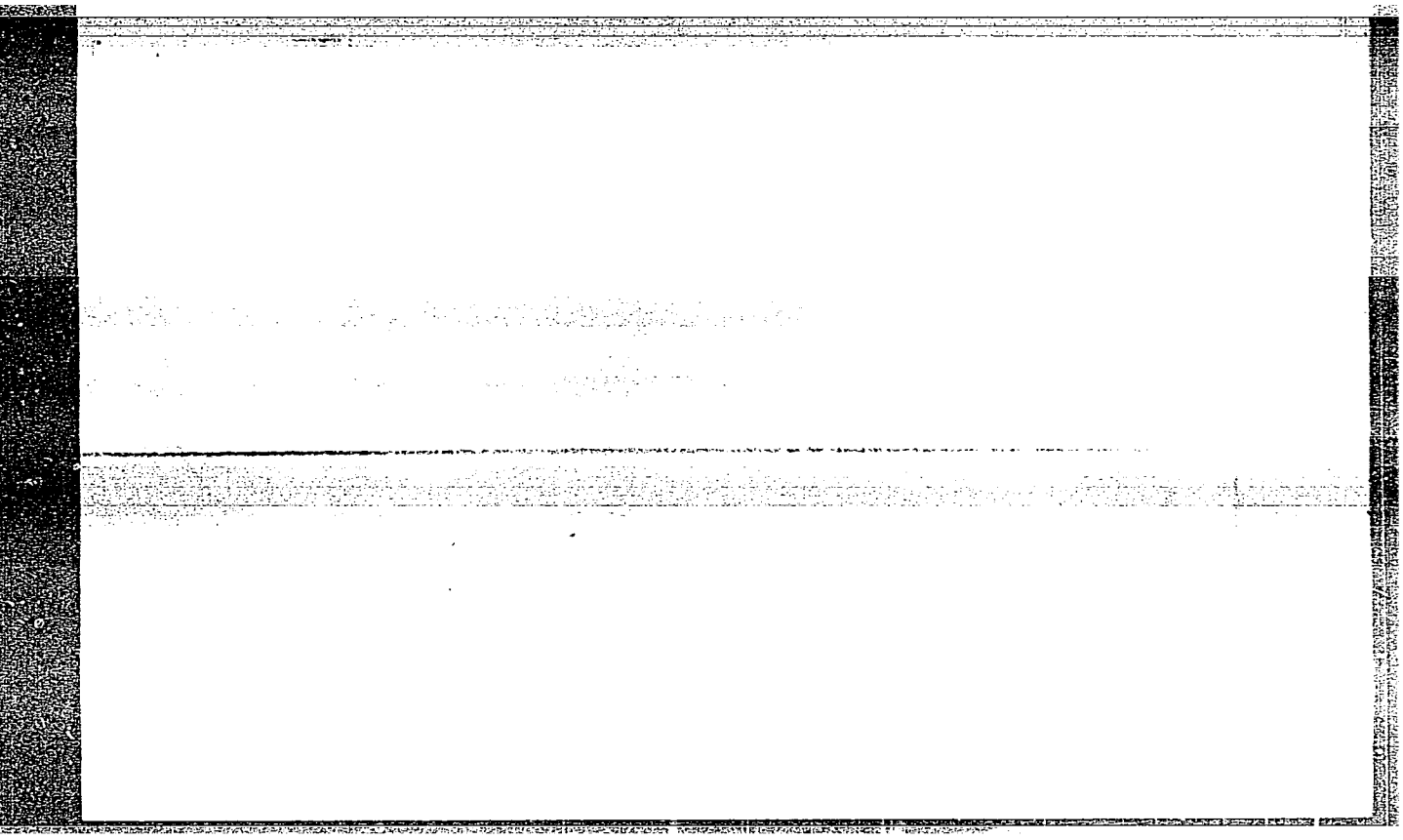
BUYNOV, N.N.; LERINMAN, R.M.; KLYUSHIN, V.V.

Electron microscopic investigation of the initial stages of destruction of supersaturated solid solutions in aluminum-base alloys. Part 2. Aging of aluminum-silver (10% Ag) alloys. Trudy Inst. fiz. met. no.14: 10-12 '54. (MLRA 8:4)
(Aluminum-silver alloys--Metallography)

BUYNOV, N.N.; LERINMAN, R.M.; GERASIMOV, A.F.

Electron microscopic investigation of the initial stages of destruction of supersaturated solid solutions in aluminum-base alloys. Part 3. Aging of aluminum-magnesium-silicon (1,4% MgSi) alloys. (MLRA 8:4)
Trudy Ins. fiz.met. no.14:13-15 '54.
(Aluminum-magnesium alloys--Metallography)





APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307810020-0"

BUYNOV, N. N.

E-5

Category : USSR/Solid State Physics - Phase Transformation in Solid Bodies

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6548

Author : Buynov, N.N.
Inst : Institute of Physics of Metals, Ural' Branch, Academy of Sciences, USSR.
Title : Aging of the Al-Cu Alloy

Orig Pub : Fiz. metallov i metallovedeniye, 1955, 1, No 2, 339-348

Abstract : On the basis of an analysis of the literature data and of the results of this investigation and earlier original investigations, an assumption is made concerning the possible mechanism of aging of the Al-Cu alloy. The Guinier-Preston zones 1 are present in the alloy immediately after hardening. During the process of low-temperature aging, the zones increase and become enriched with copper, and the Guinier-Preston zones 1 become Guinier-Preston zones 2. The basic feature of the artificial aging during the stage of vigorous strengthening of the alloy is the enrichment of the existing zones by copper and their allotropic transformation into

Card : 1/2

Buynov, N.N.

E-5

Category : USSR/Solid State Physics - Phase Transformation in Solid Bodies

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6647

Author : Buynov, N.N., Rodrezov, L.I.
Inst : Institute of Physics of Metals, Ural'Branch, Academy of Sciences, USSR
Title : X-ray Diffraction and Electron-Microscope Investigation of Aging of an Al-Zn Alloy.

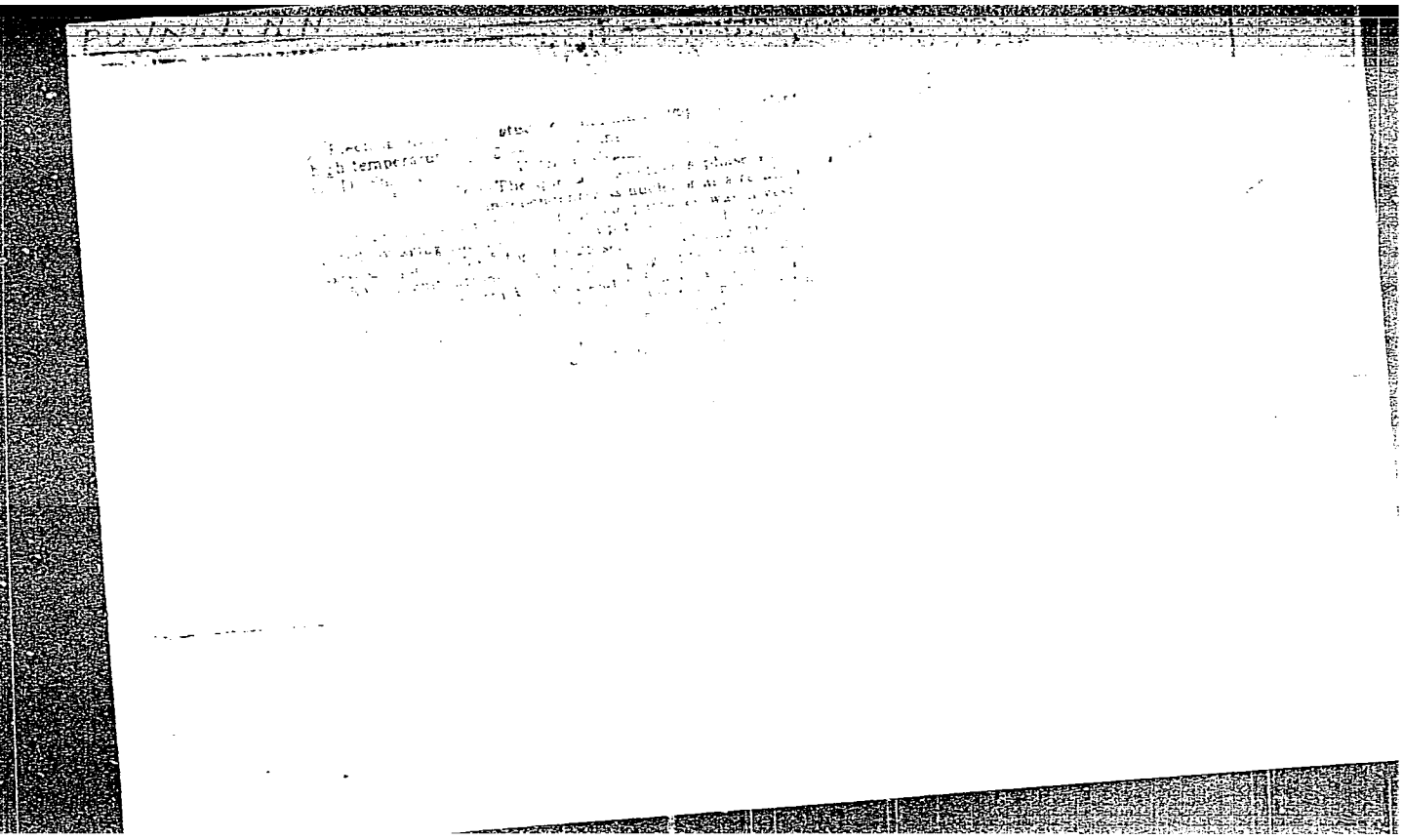
Orig Pub : Fiz. metallov i metallovedeniye, 1955, 1, No 2, 349-358

Abstract : An Al-Zn alloy with 25% Zn by weight was investigated with an electron microscope and by X-ray diffraction (using the coarse grain specimen method). In the initial stage of the aging, the Guinier-Preston zones hardly differ in their structure from the structure of the matrix, are coherently connected with it, and are little saturated with the zinc atoms; their shape is first equi-axial, and then becomes laminar. One of the fundamental features of the first stage of aging is the enrichment of the zones with zinc. It leads to a distortion of the structure of the zones themselves and

Card : 1/2

BUYNOV, N. N., PODRESOV, L. I., and KOMAROVA, N. F. (Sverdlovsk)

"The Investigation of the Precipitation in the Alloy Ni-Be," a paper submitted at the International Conference on Physics of magnetic Phenomena, Sverdlovsk, 23-31 May 56.



BUYNOV, N.N.

Category : USSR/Solid State Physics - Mechanical Properties of Crystals and Crystalline Compounds E-9

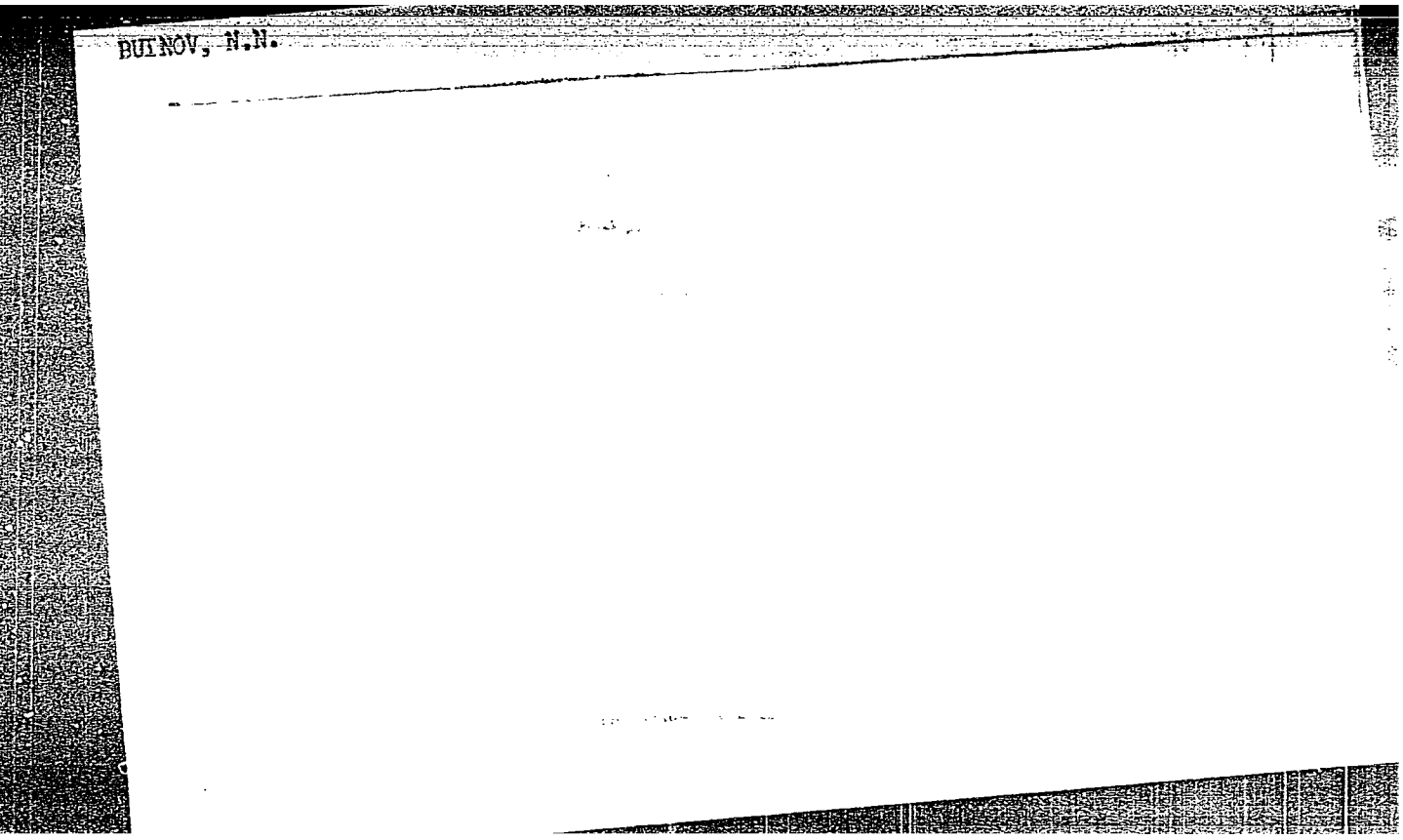
Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6788

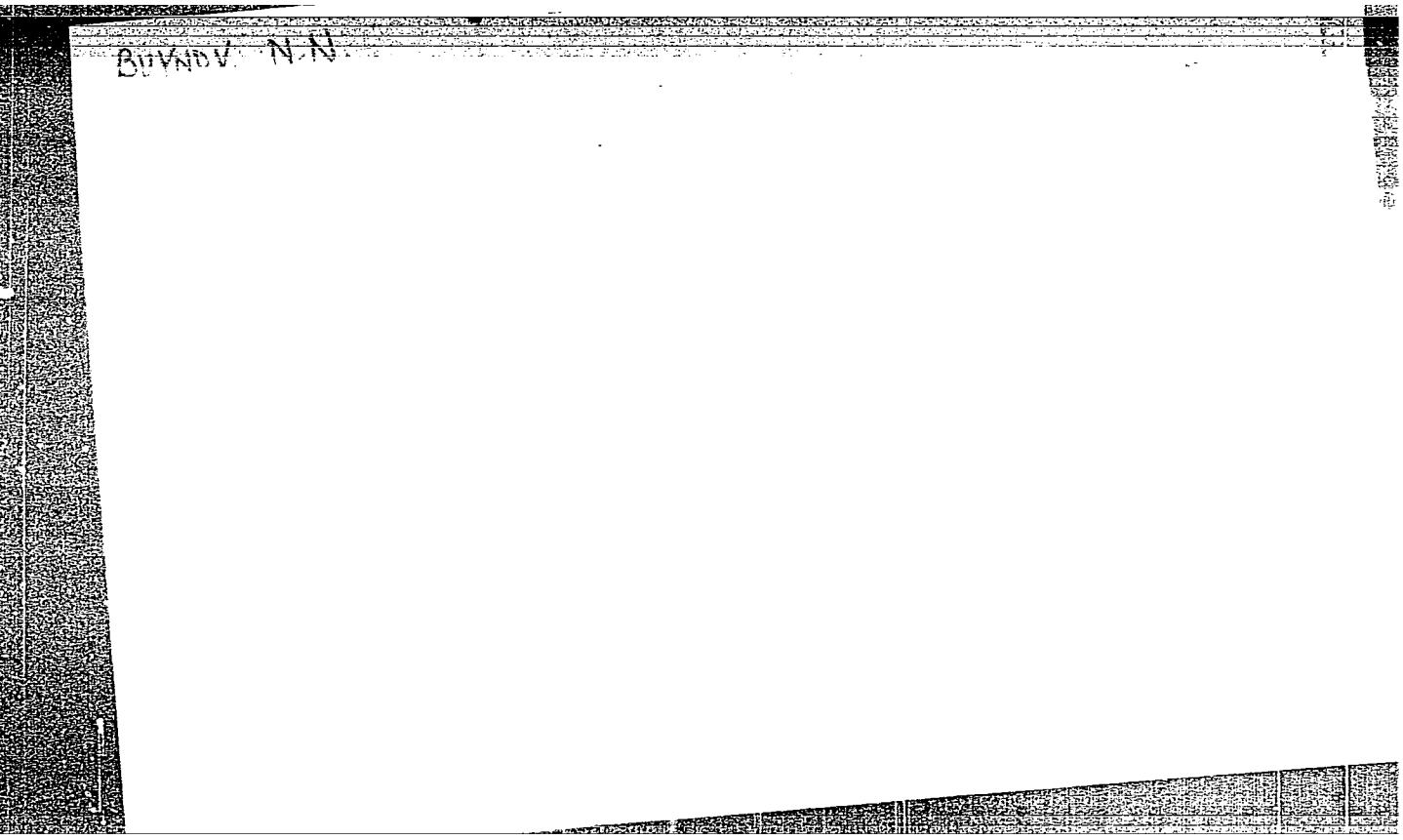
Author : Buynov, N.N.
Inst : Institute of Physics of Metals of the Ural' Branch of the Academy of Sciences, USSR
Title : Structure of the Slippage Tracks on the Surface of Deformed Aluminum Alloys.

Orig Pub : Fiz. metallov i metallovedeniye, 1956, 2, No 3, 477-483

Abstract : Using an electron microscope, an investigation was made of the structure of the slippage tracks on the deformed surface of hardened Al-Cu (4%Cu), Al-Si (1.2%Si) and Al-Mg-Si (1.4%Mg_2Si) alloys. It was established that each elementary slippage track corresponds to a slippage over a packet of atom planes. The shear over these planes is not distributed uniformly. The degree of localization of the deformation in the slippage tracks is different in different sections of the alloy. The localization of the deformation is also unequal over the length of the slippage tracks. Polycrystalline

Card : 1/2





SOV/137-58-8-17665

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 8, p 209 (USSR)

AUTHOR: Buynov, N. N.

TITLE: Certain Peculiarities of the Crystal Growth of a New Phase in Solid Metallic Solutions as Observed With the Aid of an Electron Microscope (Nekotoryye osobennosti rosta kristallov novoy fazy v tverdykh metallicheskikh rastvorakh, nablyudayemyye s pomoshch'yu elektronnogo mikroskopa)

PERIODICAL: V sb.: Rost kristallov. Moscow, AN SSSR, 1957, pp 119-127

ABSTRACT: A theoretical examination of aging processes. It is demonstrated that recrystallization in supersaturated solid solutions which tend to decompose does not occur through the formation of nuclei of a new phase, but rather through the growth of submicroscopic zones which already exist in tempered alloys and which are enriched with atoms of the alloying element. The aging diagram "zones→metastable phases→ stable phases" is confirmed. A scheme is proposed whereby atoms of an alloying component are transferred to a growing zone which has formed initially, or to a nucleus of a metastable phase. The conversion of zones into particles of metastable or stable phases proceeds

Card 1/2

Certain Peculiarities of the Crystal Growth (cont.)

by means of allotropic transformations, a factor which determines the sequence of the conversions; this sequence, however, does not preclude the process of dissolution of the zones, a fact which should be regarded as a consequence of the changes in stress distribution continuously occurring in an alloy during aging.

M. G.

1. Crystals--Growth 2. Metals--Structural analysis 3. Electron microscopes--Applications

Buynov, N. N.

AUTHORS: Lerinman, R. M., and Buynov, N. N. 126-2-13/35

TITLE: Electron microscopic and X-ray investigation of the ageing of an Al-Ag alloy. (Elektronnomikroskopicheskoye i rentgenograficheskoye issledovaniye stareniya splava Al-Ag).

PERIODICAL: Fizika Metallov i Metallovedeniye, 1957, Vol.5, No.2, pp. 279-292 (USSR)

ABSTRACT: The ageing of an Al-Ag alloy with 20% Ag, which work hardens appreciably during the process of ageing, was investigated. Due to the fact that the atomic radii of Al and Ag do not differ greatly from each other no appreciable volume changes take place. In earlier work (Refs.20, 21), the authors carried out preliminary investigations of the ageing of an Al-Ag alloy containing 10% Ag. They found that neither in the hardened state nor in the naturally aged state is the solid solution uniform. On electron microscope exposures white spots of the size of about 50 Å were detected which did not have clearly defined contours. The authors express the assumption that, already during hardening, nuclei of metastable phases or zones form which are enriched with silver. Existence of a non-uniform structure of the

Card 1/4

126-2-13/35

Electron microscopic and X-ray investigation of the ageing of an Al-Ag alloy.

Al-Ag alloy, even at temperatures above the solubility curve, was later proved by X-ray investigations (Refs.10 and 11). After tempering at 175°C these non-uniformity areas were more pronounced and simultaneously lamellar separations were observed. Even in short duration heating of an alloy at 210°C growth was observed of the zones and of the lamellae. The formation and growth of lamellar separations were accompanied by the mosaic blocks becoming smaller. It was found that lamellar separations have a fine structure. The investigations described in this paper aimed at obtaining a more complete structural picture of the decomposition of the Al-Ag alloy. The results obtained by X-ray and electron microscopic investigations are compared with hardness data. The specimens for the X-ray investigations were in the form of 0.2 mm dia. wire and for hardness measurements in the form of a square rod of the size of 5 mm; the hardness was measured by means of a Rockwell hardness tester with a steel ball and a loading of 100 kg. All the specimens were hardened from 535°C in water and

Card 2/4

126-2-13/35

Electron microscopic and X-ray investigation of the ageing of an Al-Ag alloy.

aged respectively at 20, 100, 165, 200, 250, 300 and 425°C. At each of these temperatures the ageing time was varied considerably. Diagrams are included of the change of hardness as a function of the ageing time (isothermal curves), Fig.1, and of the change of hardness as a function of the temperature for a constant ageing time (isochronous curves), Fig.2. Electron microscopic investigations of the structure and the hardness tests were made on the same specimens. Most of the specimens were tested in the electrically polished state. However, some were investigated in the deep-etched state. Figs. 3, 5, 6, 7 and 8 show some of the electron microscope exposures which were obtained. The X-ray structural investigation was carried out using a method developed by A. M. Yelistratov, (Ref.4) based on studying the anomalous X-ray effects in polycrystalline coarse grain specimens with variable irradiation (variable wave length). Some of the X-ray patterns are reproduced, Figs. 10 and 11. The results are discussed and evaluated in some detail, comparing the information obtained by

Card 3/4 electron microscopic investigations of the structural

Electron microscopic and X-ray investigation of the ageing of an Al-Ag alloy.

changes during various stages of ageing of the Al-Ag alloy with the invariant anomalous diffraction effects detected on the X-ray patterns. Good agreement was found to exist between the dimensions of the zones on the pictures produced by the electron microscope and the data calculated from X-ray patterns. More information was obtained on the structure of those zones of anomalous scattering which correspond to silver enriched zones of the solid solution. By means of the electron microscopic method the dimensions of the zones and of the particles of the metastable γ'-phase, which correspond to various stages of ageing, were determined. The structure was established which corresponds to the stage of maximum hardening. It was found that recovery does not lead to a full dissolution of the zones, nor even to dissolution of a considerable part of these.

Acknowledgments are expressed to Professor Yu. A.Bagaryatskiy for his valuable comments and evaluation of the described results. There are 11 figures, 1 table and 25 references, 7 of which are Slavic.

SUBMITTED: June 22, 1956 (Initially), July 25,1956(after revision).
ASSOCIATION: Institute of Metal Physics Ural Branch Ac.Sc. USSR. (Institut Fiziki Metallov Ural'skogo Filiala AN SSSR)

Card 4/4

AUTHORS: Buynov, N. N. and Shchegoleva, T. V. 126-5-3-31/31

TITLE: Nature of the Etching Patterns in an Ageing Alloy Al-Zn-Cu (Priroda figur travleniya v stareyushchem splave Al-Zn-Cu)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1957, Vol 5, Nr 3, pp 566-567 (USSR)

ABSTRACT: According to Hirsch and Forte (Refs. 1 and 2) the etching patterns in crystals of various substances are associated with entry to the surface of spiral and boundary dislocations. During electron microscopic investigations of the alloy Al-Zn-Cu, after preliminary rolling and homogenization annealing, spiral etching patterns of cubic shape were detected by the authors on the etched surface (Figs.1 and 2, p.567). After partial ageing of the alloy (which did not result in intensive hardening) clear bright spots could be seen at the steps of the etching patterns (Fig.2) which corresponded either to the zones of Guiney-Preston or to the particles of the separating out phase. The observed spirals could not be associated with dislocations having a single Burgers vector. On the basis of the features of the technique of oxide imprints which was applied in the given case, it can be assumed that the etching steps can be detected by means of an

Card 1/3

Nature of the Etching Patterns in an Ageing Alloy Al-Zn-Cu

electron microcope only for the spiral dislocations for a Burgers vector of at least 15-20 Å. In reality the Burgers vector in the given case amounts to several hundreds of Angstrom. This follows from the analysis of spectroscopic exposures as well as from the fact that the steps are clearly visible from the oxide imprints. It can, therefore, be concluded that each etching pattern is linked with protruding to the surface of the alloy of several larger or gigantic spiral dislocations which are parallel to the cubic axes of the crystal. (In view of the fact that Bontiuek, W. (Ref.5) detected helinoidal dislocations in CaF_2, the possibility arose to associate spiral etching patterns with helinoidal and prismatic dislocations). Usually in the centre of each phase of the etching pattern not one but several (mostly three) spiral dislocations of a single sign will occur. However, the complexity of some of the spiral etching patterns leads to the assumption that in a number of cases dislocations of opposite signs take place at the face centres. Thus, contrary to existing theoretical conceptions (Ref.2) on the effect that it is not justified

126-5-3-31/31

Nature of the Etching Patterns in an Ageing Alloy Al-Zn-Cu

to assume the presence of major dislocations in metals, the authors of this paper detected gigantic dislocations. Such dislocations, with Burgers vectors of several hundred Angstroms, were detected earlier in metals only by Amelinx (Ref.3) and Steinberg (Ref.4). Amelinx observed it on gold crystals grown by depositing gold from a solution of germinations of NaCl; Steinberg observed it on titanium crystals produced electrolytically. In both cases the appearance of gigantic spiral dislocations can be caused by the pertaining specific conditions, for instance growth on foreign body crystals. Amelinx pointed out that in his experiments, gold crystals could either follow the spiral dislocations of the common salt or appear due to major non-correspondence of the crystal lattices of gold and NaCl. In the here described experiments such conditions have apparently been made impossible.

Card 3/3 There are 2 figures and 5 references, 1 of which is Soviet, 4 English.

Note: This is a complete translation.

ASSOCIATION: Institut fiziki metallov Ural'skogo filiala AN SSSR (Institute of Metal Physics, Ural Branch of the Ac.Sc.USSR)

SUBMITTED: April 11, 1957

(UCOML-DC-55976

1. Aluminum-copper-zinc alloys--Aging 2. Aluminum-copper-zinc alloys --Crystal structure 3. Crystals--Physical properties

BUYNOV, N.N.

AUTHORS: Buynov, N. N., Podrezov, L. I., Komarova, M. F. 48-9-2/26

TITLE: An Investigation of the Decomposition of an Ni-Be Alloy (Issledovaniye raspada v splave Ni-Be).

PERIODICAL: Izvestiya AN SSSR Seriya Fizicheskaya, 1957, Vol. 21, Nr 9, pp. 1220-1224 (USSR).

ABSTRACT: For the purposes of this investigation a nickel-beryllium alloy was produced in a high-frequency vacuum furnace. The alloy contained apart from 1,9% Be: 1,25 % Fe, 0,12 % Al, 0,16 % Cu, 0,15 % Si and traces of Mg. Afterwards the alloy was forged in a hot state and homogenized at 1100°C for 15 hrs. On the basis of structural analysis conducted by electron microscope and X ray investigation of strength and coercive force together with data from literature it is shown that the composition of the Ni-Be alloy takes place in two stages, just as the decomposition of Al-Cu-, Al-Ag- and Al-Zn-alloys. In the first stage of the decomposition, zones are formed, enriched with the alloyed component, together with considerable elastic deformations, leading to elastic distortions of the black structure. The state of maximum strength is connected with this stage. It can be assumed, that the localization zones and domains of elastic deformation show

Card 1/2

An Investigation of the Decomposition of an Ni-Be Alloy. 48-9-2/26

only weak resistance to magnetic reversal, because the coercive force varies only very little in the first stage of decomposition. In the second stage of decomposition a zonal transformation into particles of the β-phase takes place in the alloy. Correspondingly the coercitive force of the alloy increases from a few Oerstedt to about 80 Oe. Finally it is stated, that the large coercitive force of the Ni-Be alloy is connected with the formation of particles of the β-phase, and not with the existence of stress.
There are 6 figures, 1 table and 12 references, 7 of which are Slavic.

ASSOCIATION: Institute for Metal Physics of the UFAN USSR (Institut fiziki metallov UFAN SSSR.).

AVAILABLE: Library of Congress.

Card 2/2

BUYNOV, N. N.

"X-Ray and Electron-microscope Investigation of the Aging of Aluminum Alloys"

Light Alloys. no. 1: Physical Metallurgy, Heat Treatment, Casting, and Forming; Principal Reports of the Conference, Moscow, Izd-vo AN SSSR, 1958. 497 P.

(2nd. A.U. Conf. on Light Alloys, 1955)

ISU4/NoV N.N.

PHASE I BOOK EXPLOITATION SOV/3847
SOV/26-M-20

Akademiya nauk SSSR: Ural'skiy filial. Institut fiziki metallov

Trudy, vyp. 20 (Transactions of the Institute of the Physics of Metals, Ural Branch, Academy of Sciences USSR, No. 20) Sverdlovsk, 1958. 402 p. Errata slip inserted. 1,000 copies printed.

Resp. Eds.: S.V. Vonsovskiy, Corresponding Member, Academy of Sciences USSR, and V.I. Arkharov, Doctor of Technical Sciences.

PURPOSE: This book is intended for scientists working in the field of physical metallurgy.

COVERAGE: This is a collection of 28 articles written by members of the Institute of the Physics of Metals, Ural Branch of the Academy of Sciences USSR, on problems investigated at the Institute. Studies at the Institute have concentrated on two basic problems: 1) developing a theory of metals and alloys and finding ways to improve the properties of engineering materials; and 2) developing new physical methods for investigating and controlling the quality of materials and metal articles. In connection with these basic problems the articles in the collection treat the following subjects: problems of the multielectron quantum-mechanical theory of solids; the laws of distribution and diffusion of additives in various metallic alloys (internal adsorption theory); strength and plasticity of polycrystalline materials in relation to interatomic binding forces, distortions in the crystal lattice; structural theory of diffusion reaction, i.e. diffusion due to chemical reactions in solid phases; theory of the magnetic structure of ferromagnetic substances; theory of magnetic measurements (magnetic flaw detection and structural analysis). The first article gives a description of the work being done by the Institute and a list of departments and laboratories along with their chief personnel. Several persons are cited for their work at the Institute. References accompany each article.

AVAILABLE: Library of Congress (TN607.A4)

Card 6/6

JA/gdh/jb
8-2-60

SOV/137-58-10-21517

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 10, p 151 (USSR)

AUTHOR: Buynov, N. N.

TITLE: X-ray Diffraction and Electron-microscope Investigations of the Process of Aging of Aluminum Alloys (Rentgenograficheskoye i elektronnomikroskopicheskoye issledovaniye stareniya alyuminiyevykh splavov)

PERIODICAL: V sb.: Legkiye splavy. Nr 1. Moscow, 1958, pp 186-199

ABSTRACT: An electron microscope was employed in an investigation of an Al alloy containing 4% Cu which had been subjected to quenching followed by aging at 190 and 150°C as well as at room temperature. Changes in hardness were also determined. An Al alloy containing 25% Zn was subjected to X-ray diffraction and electron-microscope studies after it had been quenched and allowed to age at 130 and 200° and at room temperature. In the beginning of the aging process Guignet-Preston zones (GPZ), rich in alloying elements and possessing a distorted structure of the base metal, are formed in the alloys. The GPZ are not sufficiently rich in alloying elements to meet the composition requirements of metastable (θ' in the case of an Al-Cu alloy)

Card 1/2

X-ray Diffraction and Electron-microscope Investigations (cont.)

and stable (particles of Zn in Al-Zn alloys) phases. A basic peculiarity of artificial aging is the process of enrichment of the GPZ and their allotropic transformation into θ' -phase or Zn particles. At the instant of transformation of the GPZ, stresses induced by cohesive forces existing between the zones and the base constituent are relieved, while new stresses, produced by "hydrostatic pressure", appear. The reduction in the strength of alloys in the course of artificial aging is connected with the disruption of cohesive bonds between the basic constituent and the zones during the transformation of the latter into particles, and with the relief of stresses caused by "hydrostatic pressure." The process of growth of the GPZ and of the particles proceeds at a discrete rate and is, apparently, not responsible for any significant weakening of the alloy. Ref RZhMet, 1957, Nr 3, abstract 4661.

1. Aluminum alloys--Aging 2. Aluminum alloys--X-ray diffraction analysis 3. Electron microscopes--Applications

L. V.

Card 2/2